

DEPARTMENT OF COMMERCE AND LABOR

BUREAU OF THE CENSUS

S. N. D. NORTH, DIRECTOR

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BULLETIN 91

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TRANSPORTATION BY WATER : 1906

UNITED STATES

BUREAU OF THE  
LIBRARY



WASHINGTON  
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1908

## BULLETINS OF THE PERMANENT CENSUS.

1. Geographical distribution of population.
2. Quantity of cotton ginned in the United States (crops of 1899 to 1902, inclusive).
- \*3. Street and electric railways.
4. A discussion of increase of population.
- \*5. Central electric light and power stations.
6. Mineral industries of Porto Rico.
7. Estimates of population of the larger cities of the United States for 1901, 1902, and 1903.
8. Negroes in the United States.
9. Mines and quarries.
- \*10. Quantity of cotton ginned in the United States (crops of 1899 to 1903, inclusive).
11. Municipal electric fire alarm and police patrol systems.
12. The executive civil service of the United States.
13. A discussion of age statistics.
14. Proportion of the sexes in the United States.
15. A discussion of the vital statistics of the Twelfth Census.
16. Irrigation in the United States: 1902.
17. Telephones and telegraphs: 1902.
18. Census of manufactures: 1904. Michigan.
- \*19. Quantity of cotton ginned in the United States (crops of 1900 to 1904, inclusive).
20. Statistics of cities having a population of over 25,000: 1902 and 1903.
21. Commercial valuation of railway operating property in the United States: 1904.
22. Proportion of children in the United States.
23. Census statistics of teachers.
24. Insular and municipal finances in Porto Rico for the fiscal year 1902-3.
25. American cotton supply and its distribution for the year ending August 31, 1905.
26. Illiteracy in the United States.
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28. Census of manufactures: 1905. Kansas.
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NOTE.—Bulletins in this list, except those marked with an asterisk (\*), may be obtained upon application to the Director of the Census.

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## LETTER OF TRANSMITTAL.

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DEPARTMENT OF COMMERCE AND LABOR,  
BUREAU OF THE CENSUS,  
*Washington, D. C., March 16, 1908.*

SIR:

Section 7 of the act of Congress of March 6, 1902, as amended by act of June 7, 1906, provides for a census of transportation by water, and I have the honor to transmit herewith a bulletin containing the results of this census, which covers the calendar year ending December 31, 1906. This bulletin has been prepared under the immediate supervision of Mr. William M. Steuart, chief statistician for manufactures, and contains a summarization of the main features of the census. Further details are reserved for publication in the separate reports, which are now being prepared, for the shipping on the Atlantic coast and Gulf of Mexico, the Pacific coast, the Great Lakes and the St. Lawrence river, the Mississippi river and its tributaries, and all other inland waters, respectively.

Representatives of a number of the principal shipping companies were consulted in regard to the scope of this census, and it was decided that it would be impossible to secure reliable statistics concerning cost of operating all of the craft necessarily included in the census. The schedule was designed principally to develop statistics which would show the magnitude of the water transportation interests on the coasts and inland waters of the United States, and it was believed that a simple schedule was best adapted for this purpose.

Very respectfully,



*Director.*

Hon. OSCAR S. STRAUS,  
*Secretary of Commerce and Labor.*

# TRANSPORTATION BY WATER: 1906.

## UNITED STATES.

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### SCOPE OF THE CENSUS.

This bulletin presents statistics for the year ending December 31, 1906, for all American documented and undocumented vessels or craft of 5 tons net register or over. It therefore includes all craft of the required ownership and tonnage operated on the coasts and inland waters of the United States, Porto Rico, and the Hawaiian Islands, or between the ports of these and other countries. It also includes a few craft of American ownership that did not visit American ports during 1906, but does not include craft operating exclusively in the waters of the Philippine Islands, or between such waters and ports of foreign countries.

All classes of floating equipment were included except those owned by the Federal Government, those engaged in fishing, stationary wharf boats, and house boats used largely for residence purposes. Craft engaged in fishing were omitted because they form a part of the fishing industry of the country, and are to be included in the census of that industry which is provided for by section 7 of the act of Congress of March 6, 1902.

Vessels that were in operation during all or a portion of the year are classed as "active craft" as distinguished from those idle during the entire year. The statistics for these two classes are given separately.

While a census of water transportation should cover all classes of floating equipment, manifestly it would be impracticable, and of no economic value, to include rowboats, canoes, small sailboats, launches, etc.; 5 tons was therefore fixed as the minimum size of the craft to be included.

As a basis for the fieldwork the names of vessels together with the addresses of the managing owners of all documented craft were obtained from the records of the Bureau of Navigation, Department of Commerce and Labor, and those of the undocumented craft from the offices of the collectors and surveyors of customs. The entire country was divided into districts, and the agents were instructed to make a thorough canvass of their respective districts and, in addition to accounting for all the names on the lists, to make careful inquiry and secure reports for all other craft that should be included in the census.

The managing owners of a number of the craft of American ownership have no established office on land

at which census data can be obtained, and as such craft move from port to port they frequently can not be reached through the mail. While the agents made every effort to secure reports for them, some were evidently omitted from the canvass; a few unimportant craft operating on small lakes, difficult of access, were also omitted. In the aggregate, however, these omissions were insignificant, and it is believed that the canvass was as thorough as possible under existing conditions.

Each managing owner was required to report the class of the craft operated, the gross and net tonnage, character of materials from which constructed, motive power, waters in which operated, terminal points of regular routes, commercial value of the craft and of the land property incident to its operation, gross income for the year, persons employed and amount paid in salaries and wages, number of passengers carried, and the quantity of the different varieties of freight shipped from and delivered at the principal ports. This bulletin contains a summary of the statistics for most of the features developed by the schedule, but further details are reserved for publication in the final report.

In deference to the wishes of the shipowners, and in view of the fact that it was impracticable to obtain definite information concerning the operating expenses for all of the craft included in the census, no inquiries were made concerning expenses other than the amounts paid in salaries and wages. The primary object of the census, moreover, was to show the magnitude of the transportation interests on the different waters of the United States, and it was believed that this could be most readily accomplished by a simple schedule applicable to all classes of craft. The report contains, therefore, no information in regard to profits, cost of carrying passengers or freight, or other features depending upon statistics of expenditures.

### COMPARISON WITH PRIOR CENSUSES.

When possible the statistics for 1906 have been compared with those for prior censuses. The census of 1880 contains statistics and general information for the "merchant steam marine" and also the approxi-

mate number, tonnage, and value of sailing vessels, canal boats, barges, and flat and wharf boats. The statistics were compiled largely from the records of the Register of the Treasury and of the offices of local United States inspectors, and from other official sources. No organized canvass of all classes of craft was made as in 1906 and, with the exception of those for steam vessels, the totals are so incomplete that they should not be placed in comparison with those for 1889 or 1906.

At the census of 1889 an attempt was made to secure reports from all classes of craft of over 5 tons burden, but it appears to have been difficult at that time to apply a uniform schedule and instructions to all sections of the country. For example, fishing vessels were included in the statistics for the Pacific coast, but were excluded from the totals for other sections of the country; pile drivers, sand dredges, sand boats, and fire boats were reported for some sections of the country but not for others. A considerable proportion of the craft included in the census of 1889 failed also to make report of income, employees, wages, passengers or freight, and estimates for these items were prepared in the Census Office. At the census of 1889 no attempt was made to secure information respecting vessel interests upon state waters, while at the census of 1906 all waters were covered.

While it is probable that a more thorough enumeration was made at the census of 1906 than at that of 1889, it is known that some craft were omitted from both censuses. The extent of these omissions can not be determined, but a comparison of the reports for the census of 1906 with the records of the Bureau of Navigation establishes the fact that the documented, enrolled, and licensed vessels omitted from the census of 1906 are of small tonnage and that their exclusion has no appreciable effect on the totals.

The report for the census of 1889 does not include returns for Alaska. In 1889 very little shipping was carried on entirely within Alaskan waters, and the majority of the craft operating between Alaska and ports in California, Washington, or Oregon were credited to the states and not to Alaska. Under these conditions, to show the increase, it is proper to compare the totals for the shipping on the Pacific coast including Alaska in 1906 with those for the Pacific coast in 1889.

The statistics for Porto Rico and the Hawaiian Islands were not included in the census of 1889; they are now presented separately and not included in the totals for the United States. The totals for 1889 and 1906 have been made further comparable by including as far as possible the same class of craft in each of the three groups shown in Table 1.

TABLE 1.—ALL VESSELS AND CRAFT: 1906 AND 1889.

[Vessels operating as connecting links in railroad systems did not uniformly report the tonnage of freight carried or income for the year. In addition to the craft reported in this table there were 1,762 vessels, with a gross tonnage of 179,326, reported as idle in 1906, and 1,490, with a gross tonnage of 233,639, reported as idle, untraceable, or lost prior to or during 1889.]

	TOTAL.			STEAM AND GASOLINE.			SAIL. <sup>1</sup>			UNRIGGED.		
	1906	1889 <sup>2</sup>	Per cent of increase.	1906	1889	Per cent of increase.	1906	1889	Per cent of increase.	1906	1889	Per cent of increase.
Number of vessels.....	37,321	30,485	22.4	9,927	5,603	77.2	7,131	7,945	* 10.2	20,263	16,937	19.6
Gross tonnage.....	12,893,429	8,350,135	54.2	4,059,521	1,710,073	137.4	1,704,277	1,675,706	1.7	7,129,631	4,973,356	43.4
Value of vessels.....	\$507,973,121	\$206,902,352	145.4	\$386,772,727	\$131,567,427	194.0	\$56,206,145	\$53,192,972	* 5.7	\$64,994,249	\$22,231,953	192.3
Gross income.....	\$294,854,532	*\$161,994,066	82.0	\$262,167,342	*\$113,715,700	130.5	\$32,687,190	\$48,278,366	* 32.3	( <sup>3</sup> )	( <sup>3</sup> )	.....
Number of employees <sup>4</sup> .....	140,929	* 113,870	23.8	115,525	* 770,347	64.2	25,404	43,523	* 41.6	( <sup>3</sup> )	( <sup>3</sup> )	.....
Wages <sup>5</sup> .....	\$71,636,521	*\$41,482,812	72.7	\$61,265,474	*\$28,521,220	114.8	\$10,371,047	\$12,961,592	* 20.0	( <sup>3</sup> )	( <sup>3</sup> )	.....
Number of passengers carried.....	366,825,663	198,902,438	84.3	366,800,748	198,992,438	84.3	24,915	.....	.....	( <sup>3</sup> )	( <sup>3</sup> )	.....
Freight carried, including harbor work (net tons) <sup>6</sup> .....	265,546,845	129,851,658	104.5	.....	.....	.....	.....	.....	.....	.....	.....	.....

<sup>1</sup> Includes schooner barges, scow schooners, etc.

<sup>2</sup> Total for 1889 includes 52 craft with a gross tonnage of 2,553, valued at \$75,360, for which no report was made for income, employees, wages, number of passengers and freight carried.

<sup>3</sup> Decrease.

<sup>4</sup> Exclusive of income for canal boats.

<sup>5</sup> Included in statistics for steam and gasoline vessels.

<sup>6</sup> Does not include employees or wages for yachts on the Atlantic coast in 1889.

<sup>7</sup> Exclusive of employees on canal boats.

<sup>8</sup> Statistics for freight not directly comparable; for explanation, see page 37.

#### SUMMARY OF STATISTICS.

The increase in the shipping interests of the country has been due to the increase in steam vessels and unriggered craft. During the period of seventeen years the tonnage and value of the steam vessels more than doubled and there were also large increases for the unriggered craft, but the tonnage and value of sailing vessels increased only 1.7 and 5.7 per cent, respec-

tively, while a considerable decrease occurred in their number and in the extent of their operations.

From the report of the Bureau of Navigation it appears that there were 24,898 vessels, with a tonnage of 6,647,007, registered, enrolled, and licensed in the United States on June 30, 1906, exclusive of Porto Rico, Hawaii, and the Philippines. The census covers 19,586 documented, registered, enrolled, or licensed craft, of which 18,199, with 6,362,215 tonnage, were

in operation all or a portion of the year, and 1,387, with a tonnage of 131,138, were idle during the entire year. Of the remaining 5,312 documented craft, some were engaged in the fishing industry, others had been destroyed or abandoned, and still others could not be located by the agents of the Census Office.

Craft of all classes, whether active or idle, exclusive

of vessels owned by the Federal Government, numbered 31,975 at the census of 1889 and had a combined tonnage of 8,592,774, while at the census of 1906 they numbered 39,083 and had a combined tonnage of 13,072,755. These figures represent an increase in number of 7,108, or 22.2 per cent, and an increase in tonnage of 4,479,981, or 52.1 per cent.

TABLE 2.—ALL VESSELS AND CRAFT, BY OCCUPATION, AND PER CENT IN EACH GROUP: 1906.

OCCUPATION.	VESSELS.		TONNAGE.		VALUE OF VESSELS.		GROSS INCOME.		EMPLOYEES.		WAGES.	
	Number.	Per cent.	Gross tons.	Per cent.	Amount.	Per cent.	Amount.	Per cent.	Number.	Per cent.	Amount.	Per cent.
United States.....	37,321	100.0	12,893,429	100.0	\$507,973,121	100.0	\$294,854,532	100.0	140,929	100.0	\$71,636,521	100.0
Commercial vessels.....	32,674	87.5	12,736,529	98.8	471,268,723	92.8	291,418,998	98.8	130,315	92.5	67,013,594	93.5
Freight and passenger.....	8,796	23.6	5,084,450	39.4	337,633,845	66.5	193,565,044	65.6	84,853	60.2	40,220,763	56.1
Ferryboats.....	536	1.4	261,073	2.0	29,578,380	5.8	17,291,073	5.9	4,519	3.2	3,537,180	4.9
Tugs and other towing vessels.....	3,079	8.3	261,375	2.0	39,062,249	7.7	43,943,328	14.9	20,870	14.8	12,494,685	17.4
Unrigged craft.....	20,263	54.3	7,129,631	55.3	64,994,249	12.8	136,619,553	12.4	120,073	14.2	10,760,966	15.0
Yachts.....	3,770	10.1	106,430	0.8	28,451,114	5.6	28,578	(?)	7,807	5.5	2,848,728	4.0
All other.....	877	2.3	50,470	0.4	8,253,284	1.6	3,406,956	1.2	2,807	2.0	1,774,199	2.5

<sup>1</sup> In many cases the income, employees, and wages for unrigged craft were not reported separately but were included in the reports for towing vessels.

<sup>2</sup> Less than one-tenth of 1 per cent.

The majority of the craft and by far the largest proportion of the tonnage are engaged directly or indirectly in the transportation of freight and passengers. This class of service is represented not only by the steam and sail freight and passenger vessels, but by ferries, towing vessels, and unrigged craft, designated in the above table as "commercial vessels;" their tonnage was 12,736,529, and represents 98.8 per cent of the total for all craft. While a large part of the American tonnage is identified with the movement of freight and passengers, only 8,796 steam and sail vessels were classed as "regular freight and passenger," and the tonnage of this class formed only 39.4 per cent of the total. But the commercial value and amount of business done by these vessels was of much greater relative importance, the percentage of value represented by them amounting to as much as 66.5 of the value of all craft. They earned 65.6 per cent of the gross income, gave employment to 60.2 per cent of the persons required to operate the 37,321 vessels and craft included in the census, and paid 56.1 per cent of the total wages.

DIAGRAM 1.—Gross tonnage of all vessels, by classes: 1906 and 1889.

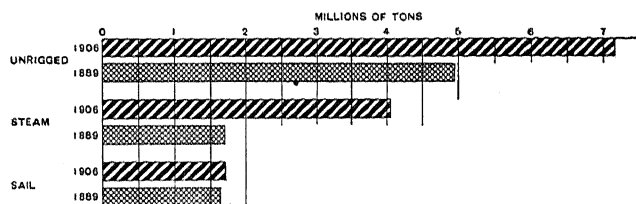
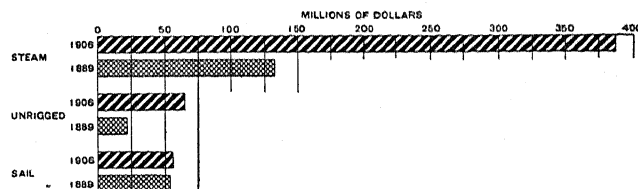


DIAGRAM 2.—Value of all vessels, by classes: 1906 and 1889.



The unrigged class represents more than half of the number and tonnage engaged in the freight movement, but their value forms a very much smaller proportion of the total. The group includes some dredges, pile drivers, and similar craft, the tonnage

of which, however, represents only a small proportion of the total tonnage of unrigged vessels.

#### UNDOCUMENTED CRAFT.

In analyzing the census data it is interesting to know the number and tonnage of undocumented craft included. Such information is given in Table 3.

TABLE 3.—*Number and tonnage of active and idle undocumented craft included in the census: 1906.*

CLASS.	Number of vessels.	Gross tonnage.
Aggregate.....	19,497	6,579,402
Active.....	19,122	6,531,214
Steam.....	1,250	46,705
Sail.....	533	5,355
Unrigged.....	17,339	6,479,154
Idle.....	375	48,188
Steam.....	107	7,689
Sail.....	33	559
Unrigged.....	235	39,940

The undocumented craft, consisting principally of yachts, harbor craft, canal boats, and barges operating on the rivers and other inland waters, form a considerable proportion of the number and tonnage of all vessels included in the census. As it is not compulsory for such craft to have documents, it is probable that the only official record concerning them is contained in the Census reports.

#### STEAM VESSELS.

The total for steam vessels includes all craft of every description propelled by steam, gasoline, electricity, or any motive power utilized by machinery; also craft equipped for propulsion by both machinery and sails. This includes vessels carrying freight, passengers, or both; tugs and towing vessels; towboats working with dredges, pile drivers, lighters, etc., and regular seagoing tugs; ferryboats which make regular or irregular trips between two designated points which are so close that the service is classed as "ferriage" rather than freight or passenger; and vessels operated for the pleasure of their owners and not for profit. In addition to these general classes the total includes steam vessels engaged primarily in taking out fishing parties, wreckers, pile drivers, dredges, dredge tenders, mail boats, news boats, pilot boats, floating grain elevators,

dispatch boats, patrol boats, and other boats engaged in work incident to but not directly allied to the freight and passenger movement. The miscellaneous character of the craft included makes it necessary to classify the total as far as possible by the class of work in which the vessels were engaged during the census year, and this is done in Table 4.

TABLE 4.—*Steam vessels, by occupation, with per cent each class is of total: 1906.*

OCCUPATION.	Number of vessels.	Per cent.	Gross tonnage.	Per cent.	Value of vessels.	Per cent.
Total.....	9,927	100.0	4,059,521	100.0	\$386,772,727	100.0
Freight and passenger....	3,615	36.4	3,411,588	84.0	286,218,089	74.0
Tugs and other towing vessels.....	3,079	31.0	261,375	6.4	39,062,249	10.1
Ferryboats.....	536	5.4	261,073	6.4	29,578,380	7.6
Yachts.....	2,176	21.9	82,275	2.0	24,281,861	6.3
All other.....	521	5.2	43,210	1.1	7,632,148	2.0

Of the 9,927 steam vessels included in the census of 1906 only a little more than one-third were regular freight and passenger steamers, but their tonnage formed 84 per cent of the gross tonnage and their value almost three-fourths of the total value reported for all steam craft. In consideration of the large quantities of freight moved by tugs and other towing vessels they should be accepted as a part of the freight equipment. By combining the two groups it is found that they represent more than 90 per cent of the gross tonnage and more than 84 per cent of the value of the entire fleet of steam vessels. The tonnage of the ferryboats is about equal to that of the tugs and other towing vessels, but they are a distinct class of craft, for which the statistics are shown separately in Table 14. While a large number of yachts were propelled by the use of machinery, their tonnage and value form but a small proportion of the total. The group of "all other" includes steam dredges, pile drivers, etc.

The dependence of the unrigged craft upon steam vessels for power and the consequent close relation between the two kinds of craft make it impossible to arrive at a satisfactory separation of the income, employees, and wages for the two classes, and therefore they are combined in Table 5, which is introduced to show the increase in the steam craft operating on the various waters of the United States.

TABLE 5.—STEAM VESSELS, BY DIVISIONS, WITH PER CENT OF INCREASE: 1906 AND 1889.

[The statistics of gross income, number of employees, and wages include the totals for unrigged craft.]

DIVISION.	Census.	Number of vessels.	Gross tonnage.	Value of vessels.	Gross income.	Number of employees.	Wages.
Total.....	1906 1889	9,927 5,603 77.2	4,059,521 1,710,073 137.4	\$386,772,727 131,567,427 194.0	\$262,167,342 113,715,700 130.5	115,525 70,347 64.2	\$61,265,474 28,521,220 114.8
Per cent of increase.....							
Atlantic coast and Gulf of Mexico.....	1906 1889	5,413 2,536 113.4	1,457,894 741,770 96.5	193,926,327 65,518,040 196.0	139,717,909 57,034,216 145.0	58,470 130,528 91.5	31,064,945 13,284,325 138.4
Per cent of increase.....							
Pacific coast (including Alaska).....	1906 1889	1,066 465 129.2	518,107 160,293 223.2	60,440,145 14,767,355 309.3	40,220,388 12,959,914 210.3	15,661 6,682 134.4	10,230,828 3,567,226 186.8
Per cent of increase.....							
Great Lakes and St. Lawrence river.....	1906 1889	1,676 1,467 972 14.2	1,915,786 595,813 221.5	116,983,812 40,868,824 186.2	60,933,528 27,223,207 123.8	22,658 16,968 33.5	12,318,174 6,294,188 95.7
Per cent of increase.....							
Mississippi river and its tributaries.....	1906 1889	1,435 972 47.6	146,227 192,974 224.2	13,196,770 9,622,608 37.1	17,342,038 16,331,872 6.2	15,016 15,951 5.9	5,692,117 5,337,185 6.6
Per cent of increase.....							
All other inland waters.....	1906 1889	337 163 106.7	21,507 19,223 11.9	2,225,673 790,000 181.7	3,953,479 166,491 ( <sup>3</sup> )	3,720 218 ( <sup>3</sup> )	1,359,410 38,296 ( <sup>3</sup> )
Per cent of increase.....							

<sup>1</sup> The employees and wages for yachts were not reported.<sup>2</sup> Decrease.<sup>3</sup> Income, number of employees, and wages were not reported for canal boats at the census of 1889, and therefore the percentage of increase is not given.

There has been a considerable increase in the number and magnitude of the operations of the steam craft on all waters except the Mississippi river and its tributaries, where the tonnage of the vessels and the number of persons employed have actually decreased. There has been an increase in the size of the steam vessels operating on the Great Lakes and the Pacific coast.

The greatest absolute increase, except in the gross tonnage, is shown for the vessels operating on the Atlantic coast and Gulf of Mexico; in tonnage the largest increase occurred on the Great Lakes, and is due principally to the large steel vessels recently constructed to carry grain and ore. There was also a large increase in the steam shipping on the Pacific coast, the percentages being larger than those for any of the other divisions. The increase in the income, employees, and wages for

"all other inland waters" is due principally to the inclusion of the unrigged craft, for which it is probable a more thorough enumeration was made in 1906. But as no income, employees, or wages were reported for canal boats in 1889, the figures are not comparable and the percentages of increase are omitted.

The limitation of the census to vessels of 5 tons or over results in the exclusion of a large number of steam, gasoline, and electric launches engaged in the regular freight and passenger traffic on the lakes, bays, and rivers of the country. The number of these small vessels has increased very rapidly during recent years, and their aggregate annual business has now assumed considerable proportions.

The relative importance of the steam shipping in each of the five divisions at the censuses of 1889 and 1906 is shown in Table 6.

TABLE 6.—STEAM VESSELS, PER CENT IN EACH DIVISION: 1906 AND 1889.

DIVISION.	Census.	Number of vessels.	Gross tonnage.	Value of vessels.	Gross income.	Number of employees.	Wages.
Total.....	1906 1889	100.0 100.0	100.0 100.0	100.0 100.0	100.0 100.0	100.0 100.0	100.0 100.0
Atlantic coast and Gulf of Mexico.....	1906 1889	54.5 45.3	35.9 43.4	50.1 49.8	53.3 50.2	50.6 43.4	51.7 46.6
Pacific coast (including Alaska).....	1906 1889	10.7 8.3	12.8 9.4	15.6 11.2	15.3 11.4	13.6 9.5	16.7 12.5
Great Lakes and St. Lawrence river.....	1906 1889	16.9 26.2	47.2 34.8	30.2 31.1	23.2 23.9	19.6 24.1	20.1 22.1
Mississippi river and its tributaries.....	1906 1889	14.5 17.3	3.6 11.3	3.4 7.3	6.6 14.4	13.0 22.7	9.3 18.7
All other inland waters.....	1906 1889	3.4 2.9	0.5 1.1	0.6 0.6	1.5 0.1	3.2 0.3	2.2 0.1

With the exception of tonnage, the relative importance of the steam vessels operating on the Atlantic and Gulf coasts has increased since 1889 until these

craft now represent more than half of this class of American shipping. There has been also an increase in the relative importance of this class of vessels on

the Pacific coast, but the proportions for the Mississippi river and its tributaries have decreased. The steam vessels operating on other inland waters form such a small proportion of the total that changes in their relative importance are of slight significance. The tonnage of the steam vessels on the Great Lakes has increased much more rapidly than the number and is now in excess of that for the Atlantic and Gulf coasts, but the value and volume of business, as measured by the income, employees, and wages, were much less than on the Atlantic coast.

#### UNRIGGED CRAFT.

This class includes all craft that have no motive power of their own—all, in fact, that can not be classed as either steam or sail, such as barges, flat-boats, lighters, scows, dredges, derricks, hoisting barges, floating elevators, and also canal boats, irrespective of the waters in which they were operated during 1906. The number and tonnage of the unrigged craft exceed the totals for steam and sail, and their value is in excess of that reported for the sailing class. Since unrigged vessels are largely dependent upon steam vessels for motive power, and since the same crew frequently operates both the towing vessel and the tow, it is impossible to segregate the income so as to show the amount derived from the operation of the steam vessel as distinct from the barge or scow. For this reason the statistics of income, employees, wages, etc., are included in comparative tables with those for the steam vessels. The unrigged craft are a very important factor in the movement of freight, especially on the inland waters and in and around the principal harbors. The majority of them are built of wood, but the use of iron and steel as material during recent years has added greatly to their value and durability, and accounts in part for the greater increase in value than in number and tonnage.

TABLE 7.—Unrigged vessels, by occupation, with per cent each class is of total: 1906.

OCCUPATION.	Number of ves-sels.	Per cent.	Gross ton-nage.	Per cent.	Value of ves-sels.	Per cent.
Total.....	20,263	100.0	7,129,631	100.0	\$64,994,249	100.0
Canal boats.....	2,237	11.0	303,581	4.2	2,952,197	4.5
All other.....	18,026	89.0	6,826,050	95.7	62,042,052	95.4

Canal boats now form a comparatively small proportion of the fleet of unrigged craft, and their relative importance has been decreasing.

The increase in the variety of work in which unrigged craft can be employed—their use in the shipment of coal and other heavy freight between coast ports, as well as on the lakes, rivers, and canals, and between points within harbors—has caused great activity in their construction. Barges, lighters, and similar craft can be used most economically for this class of work, and,

as shown in Table 2, their number and tonnage now form a considerable proportion of the total American shipping. They are used most extensively on the Atlantic coast and the Mississippi river and its tributaries, the greatest increase in the number and tonnage being reported for these waters. Large increases are also shown for those operating on the Pacific coast and the Great Lakes. The decrease in those reported for "all other inland waters" is due primarily to the decrease in the canal boats.

TABLE 8.—Unrigged vessels, by divisions, with per cent of increase: 1906 and 1889.

DIVISION.	Census.	Number of vessels.	Gross tonnage.	Value of vessels.
Total.....	1906 1889	20,263 16,987	7,129,631 4,973,356	\$64,994,249 22,231,953
Per cent of increase.....		19.6	43.4	192.3
Atlantic coast and Gulf of Mexico....	1906 1889	8,699 3,425	2,260,622 623,483	41,658,685 7,837,440
Per cent of increase.....		154.0	262.6	431.5
Pacific coast (including Alaska).....	1906 1889	805 489	154,297 63,356	4,649,317 825,345
Per cent of increase.....		64.6	143.5	463.3
Great Lakes and St. Lawrence river..	1906 1889	783 308	211,506 139,400	6,686,557 3,472,500
Per cent of increase.....		154.2	51.7	92.6
Mississippi river and its tributaries..	1906 1889	8,187 6,328	4,265,740 3,171,636	9,655,372 4,784,554
Per cent of increase.....		29.4	34.5	101.8
All other inland waters.....	1906 1889	1,789 6,387	237,466 975,481	2,344,318 5,312,114
Per cent of increase.....		172.0	175.7	155.9

<sup>1</sup> Decrease.

The larger portion of the freight received at the boroughs of Manhattan and Bronx and at Brooklyn, N. Y., is delivered by water craft, and a considerable proportion comes from surrounding places by means of lighters or barges. Large numbers of these craft were operated in and around New York harbor during 1906, and as they are in constant movement from place to place, probably some were missed in the enumeration. They do virtually an express and drayage business for the harbor, and it was almost as difficult to ascertain the quantity of freight handled on them as it would have been to secure similar data for the wagons and other vehicles moving freight between points on land. Lightering freight is a cheaper means of handling cargoes than the transportation on trucks, as large consignments can be handled on a single lighter, thus keeping the shipment together, and the entire amount can be delivered at one time and discharged directly into the vessel, thus avoiding extra handling. Steamers will not receive cargo after a fixed time, and it is a great advantage to get the entire shipment alongside at once, instead of delivering it on numerous trucks. In some instances, too, large steamers do not come to the wharves, but are loaded and unloaded by lighters, which obtain and deliver the freight at points most convenient to the consignors and consignees. These craft are thus indispensable to the



delivery and shipment of freight in many harbors. Estimates for the freight handled by these harbor craft aggregated 88,026,046 tons for the entire country, exclusive of the Great Lakes, in 1906.

The relative importance of the unrigged craft operating in the different divisions is shown in Table 9.

TABLE 9.—*Unrigged vessels, per cent in each division: 1906 and 1889.*

DIVISION.	Census.	Number of vessels.	Gross tonnage.	Value of vessels.
Total.....	1906 1889	100.0 100.0	100.0 100.0	100.0 100.0
Atlantic coast and Gulf of Mexico.....	1906 1889	42.9 20.2	31.7 12.5	64.1 35.2
Pacific coast (including Alaska).....	1906 1889	4.0 2.9	2.2 1.3	7.2 3.7
Great Lakes and St. Lawrence river.....	1906 1889	3.9 1.8	3.0 2.8	10.3 15.6
Mississippi river and its tributaries.....	1906 1889	40.4 37.4	59.8 63.8	14.9 21.5
All other inland waters.....	1906 1889	8.8 37.7	3.3 19.6	3.6 23.9

The number, tonnage, and value of the unrigged craft on the Atlantic and Gulf coasts and the Mississippi river and its tributaries greatly predominate over those of the other divisions. The greatest increase in relative importance is shown for the Atlantic and Gulf coasts. Although the tonnage on the Mississippi has actually increased more rapidly than the number of craft, larger barges now being used for the transportation of coal, the importance of the tonnage as compared with that in the other sections has decreased. There has been also an increase in the number and

tonnage of these vessels on the Pacific coast and the Great Lakes, but the greater increase for other divisions has resulted in but a slight advance in their relative importance.

#### SAILING VESSELS.

This class includes all craft propelled exclusively by the use of sails, irrespective of their employment, and embraces the large vessels engaged in regular traffic, pleasure craft, yachts, pilot boats, etc.

TABLE 10.—*Sail vessels, by occupation, with per cent each class is of total: 1906.*

OCCUPATION.	Number of vessels.	Per cent.	Gross tonnage.	Per cent.	Value of vessels.	Per cent.
Total.....	7,131	100.0	1,704,277	100.0	\$56,206,145	100.0
Freight and passenger	5,181	72.6	1,672,802	98.2	51,415,756	91.5
Yachts.....	1,594	22.4	24,155	1.4	4,169,253	7.4
All other.....	356	5.0	7,260	0.4	621,136	1.1

The regular freight vessels represent 98.2 per cent of the tonnage of the sailing fleet and 91.5 per cent of its value. The 356 sailing craft included in the total of "all other" were engaged in a great variety of work, such as carrying fishing, gunning, and pleasure parties; wrecking; lightering; police duty; and removing garbage. While there were almost 2,000 yachts and miscellaneous sailing craft of 5 tons or over, their aggregate tonnage amounts to less than 2 per cent of the total for sailing vessels and their value less than 9 per cent of the total value.

TABLE 11.—*SAIL VESSELS, BY DIVISIONS, WITH PER CENT OF INCREASE: 1906 AND 1889.<sup>1</sup>*

DIVISION.	Census.	Number of vessels.	Gross tonnage.	Value of vessels.	Gross income.	Number of employees.	Wages.
Total.....	1906 1889	7,131 7,945	1,704,277 1,675,706	\$56,206,145 53,192,972	\$32,687,190 48,278,366	25,404 43,523	\$10,371,047 12,961,592
Per cent of increase.....		<sup>1</sup> 10.2	1.7	5.7	<sup>2</sup> 32.3	<sup>2</sup> 41.6	<sup>2</sup> 20.0
Atlantic coast and Gulf of Mexico.....	1906 1889	5,920 6,277	1,132,905 1,293,192	37,520,903 42,685,982	20,042,015 33,113,416	18,654 33,097	6,687,314 8,838,774
Per cent of increase.....		<sup>1</sup> 5.7	<sup>2</sup> 12.4	<sup>2</sup> 12.1	<sup>2</sup> 39.5	<sup>2</sup> 43.6	<sup>2</sup> 24.3
Pacific coast (including Alaska).....	1906 1889	666 681	305,283 195,508	11,533,171 6,231,340	8,299,751 6,912,824	4,481 4,633	2,719,571 2,313,195
Per cent of increase.....		<sup>1</sup> 2.2	56.1	85.1	20.1	<sup>2</sup> 3.3	17.6
Great Lakes and St. Lawrence river.....	1906 1889	531 962	265,571 185,081	7,135,271 4,238,850	4,341,174 8,240,645	2,258 5,758	962,542 1,804,003
Per cent of increase.....		<sup>2</sup> 44.8	43.5	68.3	<sup>2</sup> 47.3	<sup>2</sup> 60.8	<sup>2</sup> 46.6
All other inland waters.....	1906 1889	14 25	518 1,925	16,800 36,800	4,250 11,481	11 35	1,620 5,620
Per cent of increase.....		<sup>2</sup> 44.0	<sup>2</sup> 73.1	<sup>2</sup> 54.4	<sup>2</sup> 63.0	<sup>2</sup> 68.6	<sup>2</sup> 71.2

<sup>1</sup> Including schooner barges, etc.

<sup>2</sup> Decrease.

<sup>3</sup> The employees and wages for yachts were not reported.

The total for sailing vessels shows a decrease in every item except tonnage and value, both of which increased slightly. The only exception to this general decrease is reported for the Pacific coast, where there was a considerable increase in the tonnage, value, and busi-

ness of the vessels, though the number decreased from 681 in 1889 to 666 in 1906. No sail vessels were reported for the Mississippi river or its tributaries, and those reported for the small lakes and other inland waters are comparatively unimportant.



TABLE 12.—SAIL VESSELS, PER CENT IN EACH DIVISION: 1906 AND 1889.

DIVISION.	Census.	Number of vessels.	Gross tonnage.	Value of vessels.	Gross income.	Number of employees.	Wages.
Total.....	1906 1889	100.0 100.0	100.0 100.0	100.0 100.0	100.0 100.0	100.0 100.0	100.0 100.0
Atlantic coast and Gulf of Mexico.....	1906 1889	83.0 79.0	66.5 77.2	66.8 80.2	61.3 68.6	73.4 76.0	64.5 68.2
Pacific coast (including Alaska).....	1906 1889	9.3 8.6	17.9 11.7	20.5 11.7	25.4 14.3	17.6 10.6	26.2 17.8
Great Lakes and St. Lawrence river.....	1906 1889	7.4 12.1	15.6 11.0	12.7 8.0	13.3 17.1	8.9 13.2	9.3 13.9
All other inland waters.....	1906 1889	0.2 0.3	( <sup>1</sup> ) 0.1	( <sup>1</sup> ) 0.1	( <sup>1</sup> ) ( <sup>1</sup> )	( <sup>1</sup> ) 0.1	( <sup>1</sup> ) ( <sup>1</sup> )

<sup>1</sup> Less than one-tenth of 1 per cent.

The proportional number of sail vessels on the Atlantic and Gulf coasts has increased since 1889, but the proportion of the tonnage and value, and of the amount of business done by vessels operating on these waters, has decreased. This relative decrease is due in part to the increase on the Pacific coast, as the relative number and importance, with the exception of the tonnage and value, have decreased also on the Great Lakes.

## SCHOONER BARGES.

The sailing vessels include craft built primarily to be towed, although equipped with sails which are used only to assist in steering. These craft, known as "schooner barges," are thus described in the report of the Commissioner of Navigation for 1905: "A seagoing schooner barge is a vessel usually towed from port to port, but rigged with masts and furnished with sails, so that if in emergency she breaks adrift from the towing steamer, she may not be helpless at sea. Nearly all of the schooner barges before 1890 were square-rigged vessels or schooners which had outlived their usefulness as such and were dismantled and converted into barges. Shortly before 1890, and to a considerable extent since, such schooner barges have been specially constructed, some of them with steel hulls. The practice of cutting down square-rigged vessels and schooners into barges still continues." The schooner barges might be classed as "unrigged craft," but the Census has followed the practice of the Bureau of Navigation and included them in the group of sail vessels. The statistics for them are shown separately in Table 13, so that they may be combined with other classes if desired.

TABLE 13.—Schooner barges: 1906.

	Total.	Atlantic coast and Gulf of Mexico.	Pacific coast.	Great Lakes and St. Lawrence river.
Number of vessels.....	515	389	9	117
Gross tonnage.....	492,697	323,618	9,077	160,002
Value of vessels.....	\$13,263,423	\$7,497,833	\$491,706	\$5,273,884
Number of employees.....	2,300	1,468	74	768
Wages.....	\$1,115,136	\$721,911	\$53,024	\$340,201

The classification of craft as sail or unrigged depends upon the designation given by the managing owners, and it is probable that some equipped with a limited amount of sail, to be used in case of emergency, were reported as "unrigged." It was impracticable to make the classification of the craft depend upon the character or amount of sail, and the line of demarcation, therefore, between the sail and the unrigged is not as clearly defined as may be desirable, but as a rule only those craft that had no sail or other motive power were included in the group of "unrigged."

## FERRYBOATS.

Vessels employed in ferry service form an important part of the water transportation system of the country. This class includes self-propelling vessels having a regular route between two neighboring points, carrying passengers, teams, etc. It also includes a certain class of railroad car ferries on which trains are transported between two points on the railroad line. It does not include car floats dependent upon towing vessels, nor a certain class of small ferryboats operated by human power that are frequently found on the small rivers and streams of the country.

For the Great Lakes and all other inland waters at the census of 1889 the gross income, number of employees, and amount of wages paid were not reported separately for ferryboats; therefore it is impossible to make comparisons of such data for those districts. The other items, however, are sufficient to indicate the great increase in the ferry traffic in all the divisions shown in the table with the exception of the Mississippi river, where there was an actual and proportional decrease in the number of employees and wages paid and a relatively small increase in the remaining items.

Ferry passengers form more than 90 per cent of all passengers reported for the census year 1906, and they are the principal source of income for ferryboats, but as shown in Table 14 these vessels derive considerable income from the carriage of freight and from other sources. The income of this character is especially large in proportion to the total for the Pacific coast, the Great Lakes, and the Mississippi river, where a

large number of railroad car ferries are operated and income is derived from other sources than the passenger service. In many cases, particularly on the Missis-

issippi river and its tributaries, the ferrying of wagons, teams, and cattle is largely in excess of the passenger business.

TABLE 14.—FERRYBOATS, BY DIVISIONS, WITH PER CENT OF INCREASE: 1906 AND 1889.

DIVISION.	Census.	Number of vessels.	Gross tonnage.	Value of vessels.	GROSS INCOME.			Number of employees.	Wages.	Number of passengers carried.
					Total.	Passengers.	All other sources.			
Total.....	1906 1889	536 456	261,073 146,104	\$29,578,380 10,442,750	\$17,291,073 ( <sup>1</sup> )	\$10,414,106 ( <sup>1</sup> )	\$6,876,967 ( <sup>1</sup> )	4,519 ( <sup>1</sup> )	\$3,537,180 ( <sup>1</sup> )	330,737,639 182,033,991
Per cent of increase.....		17.5	78.7	183.2						81.7
Atlantic coast and Gulf of Mexico.....	1906 1889	270 214	162,834 98,174	19,970,466 7,907,700	10,571,534 5,392,969	7,386,913	3,184,621	2,388 1,710	2,008,540 1,276,847	272,506,670 158,644,012
Per cent of increase.....		26.2	65.9	152.5	96.0			39.6	64.4	71.8
Pacific coast (including Alaska).....	1906 1889	47 38	40,171 24,630	4,315,522 979,300	4,208,430 994,476	2,037,580	2,170,850	759 478	708,777 395,157	39,532,354 14,291,859
Per cent of increase.....		23.7	63.1	340.7	323.2			58.8	79.4	176.6
Great Lakes and St. Lawrence river.....	1906 1889	48 40	35,581 4,702	3,429,532 498,000	922,838 ( <sup>1</sup> )	456,856 ( <sup>1</sup> )	465,982 ( <sup>1</sup> )	656 ( <sup>1</sup> )	308,156 ( <sup>1</sup> )	8,264,482 623,474
Per cent of increase.....		20.0	656.7	588.7						1,225.6
Mississippi river and its tributaries.....	1906 1889	166 163	22,180 18,593	1,776,360 1,056,250	1,553,121 1,196,817	498,747	1,054,374	699 893	413,553 456,676	10,022,612 8,474,646
Per cent of increase.....		1.8	19.3	68.2	29.8			21.7	9.4	18.3
All other inland waters.....	1906 1889	5 1	307 5	86,500 1,500	35,150 ( <sup>1</sup> )	34,010 ( <sup>1</sup> )	1,140 ( <sup>1</sup> )	17 ( <sup>1</sup> )	8,154 ( <sup>1</sup> )	321,521 ( <sup>1</sup> )
Per cent of increase.....		400.0	6,040.0	5,646.7						

<sup>1</sup> Not reported separately for ferryboats in 1889.

<sup>2</sup> Decrease.

As shown in Table 15, the ferry traffic is largely concentrated in the neighborhood of large centers of population, where different sections of the community are

separated from each other by rivers or estuaries which are not spanned by bridges or by a sufficient number of bridges to meet the demand for intercommunication.

TABLE 15.—FERRYBOATS, BY DISTRICTS, WITH PER CENT IN EACH DISTRICT: 1906.

DISTRICT.	Number of vessels.	Gross tonnage.	Value of vessels.	Gross income.	Number of employees.	Wages.	Number of passengers carried.
Total.....	536 100.0	261,073 100.0	\$29,578,380 100.0	\$17,291,073 100.0	4,519 100.0	\$3,537,180 100.0	330,737,639 100.0
New York.....	152	129,690	17,098,677	8,423,119	1,622	1,578,839	208,684,123
Per cent of total.....	28.4	49.7	57.8	48.7	35.9	44.6	63.1
Philadelphia.....	25	10,306	918,867	1,009,295	217	195,560	30,616,853
Per cent of total.....	4.7	3.9	3.1	5.8	4.8	5.5	9.2
New Orleans.....	11	1,598	214,000	154,415	65	25,467	3,524,470
Per cent of total.....	2.0	0.6	0.7	0.9	1.4	0.7	1.1
San Francisco.....	26	35,273	3,415,498	3,924,040	636	598,277	34,905,968
Per cent of total.....	4.8	13.5	11.5	22.7	14.1	16.9	10.6
Detroit.....	17	15,649	1,944,882	351,490	308	176,169	6,612,216
Per cent of total.....	3.2	6.0	6.6	2.0	6.8	5.0	2.0
All other districts.....	305	68,557	5,986,456	3,428,714	1,671	962,868	46,394,009
Per cent of total.....	56.9	26.2	20.2	19.8	37.0	27.2	14.0

The statistics for each of the five cities named in the table include all ferries operated in the neighborhood, with the city as the central point, regardless of the ownership of the lines. For example, under New York are included all ferries running between the different subdivisions of the greater city, and between New York and the cities in New Jersey. Some of these ferries are owned by the city and others by steam railroad or regular ferry companies.

In addition to the cities named, Boston, Mass., Norfolk, Va., Portland, Oreg., and Seattle, Wash., are important points in ferry traffic, but the statistics for them are included in the total for "all other districts."

Ferry traffic on the Atlantic coast and the Gulf of Mexico exceeds that in all other districts combined, and in like manner the ferry traffic in New York harbor is much greater than in any other locality in the United States, comprising for several items nearly one-half and for passengers carried and value of vessels considerably more than one-half of the total. San Francisco is next in importance to New York, with Philadelphia, Detroit, and New Orleans following in the order named.

*Municipal ferries.*—Reports were received from 29 ferryboats owned and operated by city governments, and the statistics for them are included in Table 14 and shown separately in Table 16.

TABLE 16.—MUNICIPAL FERRIES: 1906.

DISTRICT.	Number of vessels.	Gross tonnage.	Value of vessels.	GROSS INCOME.		Number of employees.	Wages.	Number of passengers carried.
				Pas-sengers.	All other sources.			
Total.....	29	20,238	\$2,503,447	\$621,280	\$263,672	290	\$458,129	20,945,055
New York harbor.....	16	14,829	2,253,000	557,437	220,905	188	360,159	12,521,847
Boston harbor.....	7	4,448	209,347	62,373	41,037	72	70,720	7,242,808
Small points on Connecticut river.....	2	60	4,100	970	1,230	4	2,150	19,400
Portland, Oreg.....	3	857	35,000	.....	.....	25	24,900	1,156,000
Wabasha, Minn.....	1	44	2,000	500	500	1	200	5,000

Of the 16 municipal ferries reported for New York harbor, 7 were operated in connection with penal or eleemosynary institutions and 9 were public ferries between different parts of the city on which regular fare was charged. The boats operated by the city of Boston and those on the Connecticut river were also public ferries on which fare was charged; the ferries operated between points in Portland, Oreg., were owned by Multnomah county and operated free of charge; and the ferry at Wabasha, Minn., was operated across the Mississippi river and fare was charged.

## YACHTS.

This class includes all craft operated primarily for the pleasure and convenience of the owners. Although they are not operated for profit and take no part in the freight and passenger movement, they are considered as forming a part of the floating equipment of the country that should be included in the census. The great increase in the number of these craft and the difficulty of obtaining satisfactory information concerning them required special arrangements to secure the census reports. The names of the documented yachts and the names and addresses of the owners were obtained from the records of the Bureau of Navigation and those of the others from the officials of the various yacht clubs. These lists were used in mailing schedules and for the guidance of the field agents, but as a considerable proportion of the yachts changed ownership during the year, it was frequently impossible to locate the vessels or to find any person who could give information concerning their tonnage or value. It is probable, therefore, that the statistics in Table 17 do not represent all the yachts of 5 tons or over that were in existence during 1906.

While yachts are, as a rule, of small tonnage, the average for the 3,770 included in the census for 1906 was slightly more than 28 gross tons per vessel; for the steam craft it was 38 tons; and for the sail, 15 tons. The average value per vessel was \$7,547; for steam, \$11,159; and for sail, \$2,616. The steam yachts include the gasoline and electric launches and represent 57.7 per cent of the total number of vessels included in this class. Yachts propelled by machinery are the only kind reported for the Mississippi river and its

tributaries, and they also predominate on all the other waters except the Pacific coast, where there was a larger number of sail craft.

TABLE 17.—Yachts—number, gross tonnage, and value, by divisions: 1906.

DIVISION.	Number of vessels.	Gross tonnage.	Value of vessels.
Total.....	3,770	106,430	\$28,451,114
Steam.....	2,176	82,275	24,281,861
Sail.....	1,594	24,155	4,169,253
Atlantic coast and Gulf of Mexico.....	2,935	91,507	25,066,082
Steam.....	1,577	70,461	21,290,339
Sail.....	1,358	21,046	3,775,743
Pacific coast (including Alaska).....	170	2,524	468,910
Steam.....	66	1,065	294,800
Sail.....	104	1,459	174,110
Great Lakes and St. Lawrence river.....	358	7,668	1,877,850
Steam.....	236	6,210	1,673,000
Sail.....	122	1,458	204,850
Mississippi river and its tributaries.....	222	3,255	563,400
Steam.....	222	3,255	563,400
Sail.....	.....	.....	.....
Canals and other inland waters of New York state.....	41	810	276,450
Steam.....	32	641	262,700
Sail.....	9	169	13,750
All other inland waters.....	44	666	198,422
Steam.....	43	643	197,622
Sail.....	1	23	800

Of the total number of yachts, 3,439, or 91.2 per cent, were owned by individuals; 246, or 6.5 per cent, by firms; 64, or 1.7 per cent, by corporations; and 21, or six-tenths of 1 per cent, by miscellaneous forms of organizations.

## RAILWAY SHIPPING.

The interests of steam railroads in American shipping are represented by car ferry lines, which form, usually, a short connecting link between two points of a railway system; by ferryboats, tugboats, lighters, barges, scows, dredges, and other floating equipment owned and operated directly by the railroad; or by transportation companies having a separate corporate organization, but as a rule subsidiary to the railroad companies which own the whole or a majority of their stock.

The companies that had a separate organization and kept separate accounts of their operations could make

complete reports to the Census Office. These companies, however, usually operate steamships between distant points, or regular ferryboats for general passenger and freight traffic, the statistics for which are included in those for freight and passenger vessels. Reasonably complete information was reported in regard to the harbor craft of railroad companies for all items except the income. This could not be given with any degree of accuracy, because it was derived from the operations of the railroads themselves, and it was impracticable to furnish an estimate of the amounts earned by the water craft. Car ferries form connecting links in railroad lines and transport for short distances whole trains of cars, both freight and passenger; the passengers are undisturbed in their journey and there is no unloading and reloading of freight. In such cases, while the number, tonnage, and value of these vessels form a part of the water transportation facilities of the country, the passengers and freight carried on them form an element in both railroad and water transportation. It was impossible therefore, in many instances, to obtain information of the business done by craft of this kind, but the statistics given in Table 18 will at least indicate the size of the fleet engaged in this service.

TABLE 18.—*Craft operated in connection with steam railroads: 1906.*

	Total.	Steam.	Unrigged.
Number of vessels.....	1,464	282	1,182
Gross tonnage.....	575,596	113,386	462,210
Value of vessels.....	\$20,960,301	\$12,738,171	\$8,222,130
Number of employees.....	5,082	3,596	1,486
Wages.....	\$3,655,977	\$2,665,118	\$990,859
Number of passengers carried.....	37,455,512	37,355,512	100,000

The totals in this table represent the craft engaged in the transportation of freight and passengers, or freight and passenger cars as connecting links in railway systems exclusively, freight vessels operated for the purpose of extending freight business from railroad terminals to adjacent ports without additional charge, vessels used in connection with construction work for railroad companies, and craft owned by the companies and engaged in lightering the freight

incident to the operations of the road. The table does not include public ferries operated by railroad companies for foot passengers and teams, or vessels owned by railroad companies but operated as regular freight and passenger lines.

## GOVERNMENT VESSELS.

As previously explained, this report does not include statistics for vessels owned by the Federal Government; it does, however, include craft owned by state and city governments, the statistics for which are shown separately in Table 19.

TABLE 19.—*Vessels owned and operated by state and city governments: 1906.*

	Total.	Steam.	Sail.	Unrigged.
Number of vessels.....	315	143	4	168
Gross tonnage.....	62,739	36,099	132	26,508
Value of vessels.....	\$8,040,696	\$6,803,468	\$10,380	\$1,226,848
Gross income.....	\$3,177,554	\$1,136,594	.....	\$2,040,960
Number of employees.....	1,884	1,150	12	722
Wages.....	\$2,073,628	\$1,308,332	\$5,470	\$759,226
Number of passengers carried.....	21,344,209	21,344,209	.....	.....

<sup>1</sup> Includes value of work done by craft of the Department of Docks and Ferries, New York city.

The totals in this table include municipal ferryboats, fire boats, police patrol boats, oyster patrol boats, scavenger and garbage boats, quarantine boats, ambulance boats, boats for the protection of fish and game, canal inspection and repair boats, dredges and dredge tenders, steam derricks, pilot boats, pile drivers, ice boats, ice breakers, boats used for scientific investigation, and those used in connection with eleemosynary institutions.

## FISHING CRAFT.

Vessels employed in the fishing industry are not included in the census of water transportation. They should nevertheless receive consideration as forming an important element of American shipping, and certain statistics for them collected by the Bureau of Fisheries in connection with other information for fisheries are summarized in Table 20.

TABLE 20.—VESSELS ENGAGED IN THE COMMERCIAL FISHERIES OF THE UNITED STATES AND THE PERSONS EMPLOYED THEREON.<sup>1</sup>

	United States.	Atlantic coast and Gulf of Mexico, 1902 and 1904.	Pacific coast, 1904.	Alaska, 1905.	Mississippi river and its tributaries, 1903.	Great Lakes, 1903.	All other inland waters, 1900 to 1903.
Fishing vessels:							
Number.....	4,915	4,631	87	3	.....	194	.....
Tonnage (net).....	97,367	86,076	7,637	148	.....	3,506	.....
Value.....	\$8,975,626	\$7,813,776	\$506,400	\$21,000	.....	\$634,450	.....
Value of outfit.....	\$3,534,027	\$3,088,728	\$289,897	\$8,000	.....	\$147,402	.....
Transporting vessels:							
Number.....	1,995	1,671	139	167	5	12	1
Tonnage (net).....	98,765	29,968	2,745	65,552	138	340	22
Value.....	\$5,077,926	\$1,795,119	\$477,600	\$2,735,807	\$11,400	\$56,000	\$2,000
Value of outfit.....	\$354,444	\$278,235	\$68,055	(?)	(?)	\$7,854	\$300
Persons employed:							
On fishing vessels.....	36,107	29,663	1,205	4,028	.....	1,211	.....
On transporting vessels.....	6,212	5,166	401	583	19	38	5

<sup>1</sup> Compiled from the reports of the Bureau of Fisheries.<sup>2</sup> Not reported.

As the statistics for the various sections of the country cover different years, the totals for the United States do not represent the vessels employed in the fishing industry at one definitely stated time. The totals for the Atlantic coast and Gulf of Mexico are a combination of the figures published separately by the Bureau of Fisheries for the New England states and the South Atlantic and Gulf states for the year 1902, and for the Middle Atlantic states for 1904.

The "persons employed" shown in the table are those employed on fishing vessels and in transporting the catch to market and the supplies to the fishing grounds. In addition, 110,484 persons were employed in shore and boat fisheries and 66,756 on shore in canneries and in various other capacities.

The 6,910 vessels reported as fishing and transporting do not include the small boats and launches employed in the industry; these numbered 82,443 and were valued at \$5,656,721.

The "outfit" for which the cost or value is shown for both classes of vessels consists of all supplies necessary in the industry except fishing apparatus, including fuel, provisions, preservatives, dories, etc. The value of the fishing apparatus, which includes seines, nets, lobster pots, dredges, etc., amounted to \$8,551,808 for all fisheries in the United States.

While the statistics do not represent all craft en-

gaged in the industry throughout the United States during any given year, they convey an idea of the number, tonnage, and value of the vessels employed in fishing, in transporting the catch, and in other work incident to the industry.

#### GEOGRAPHIC DIVISIONS.

Different conditions control the development of the shipping on the various navigable waters of the United States. The style of craft operating on the Mississippi and its tributaries could not be employed with advantage on the coasts; the vessels operating on the Great Lakes are designed especially to obtain the best results from the peculiar service in which they are to be employed on these waters. Land transportation, the location of manufacturing enterprises, the development of agricultural pursuits, the deterioration of harbor facilities, the decrease in depth of channels, and various other conditions may have greater effect in some districts than in others on the volume of freight moved. Although it is impracticable to localize the information so as to show exactly the effect of the various factors controlling the increase or decrease on each of the rivers, lakes, or canals, and in different sections of the coast, wherever possible the statistics have been presented for the five divisions shown in Table 21.

TABLE 21.—ALL CLASSES OF VESSELS AND CRAFT, BY DIVISIONS, WITH PER CENT OF INCREASE: 1906 AND 1889.

[Vessels operating as connecting links in railroad systems did not uniformly report the tonnage of freight carried or income for the year. In addition to the craft reported in this table there were 1,762 vessels with a gross tonnage of 179,326 reported as idle in 1906, and 1,490 with a gross tonnage of 233,639 reported as idle, untraceable, or lost prior to or during 1889.]

DIVISION.	Census.	Number of vessels.	Gross tonnage.	Value of vessels.	Gross income.	Number of employees.	Wages.	Number of passengers carried.
Total.....	1906	37,321	12,893,429	\$507,973,121	\$294,854,532	140,929	\$71,636,521	366,825,663
Per cent of increase.....	1889	30,435	8,359,135	206,992,352	161,994,066	113,870	41,482,812	198,962,438
		22.4	54.2	145.4	82.0	23.8	72.7	84.3
Atlantic coast and Gulf of Mexico <sup>1</sup> .....	1906	20,032	4,851,421	273,105,915	159,759,924	77,124	38,352,259	292,555,416
Per cent of increase.....	1889	12,238	2,658,445	116,042,062	90,147,632	63,625	22,123,099	170,225,458
		63.7	82.5	135.4	77.2	21.2	73.4	71.9
Pacific coast (including Alaska).....	1906	2,537	977,687	76,622,633	48,520,139	20,142	12,950,399	44,189,971
Per cent of increase.....	1889	1,635	419,157	21,824,040	19,872,738	11,315	5,880,421	15,672,093
		55.2	133.2	251.1	144.1	78.0	120.2	182.0
Great Lakes and St. Lawrence river.....	1906	2,990	2,392,863	130,305,640	65,274,702	24,916	13,280,716	14,080,146
Per cent of increase.....	1889	2,737	920,294	48,580,174	35,463,852	22,726	8,098,191	2,235,993
		9.2	160.0	169.2	84.0	9.6	64.0	529.7
Mississippi river and its tributaries.....	1906	9,622	4,411,867	22,852,142	17,342,038	15,016	5,692,117	14,122,241
Per cent of increase.....	1889	7,300	3,364,619	14,407,162	16,331,872	15,951	5,337,185	10,858,894
		31.8	31.1	58.6	6.2	5.9	6.7	30.0
All other inland waters.....	1906	2,140	259,491	4,536,791	3,957,729	3,731	1,361,030	1,877,889
Per cent of increase.....	1889	6,575	966,629	6,138,914	4,177,972	4,253	4,43,916	
		67.4	74.0	25.3				

<sup>1</sup> Total for 1889 includes 52 craft with a gross tonnage of 2,553, valued at \$75,360, for which no report was made for income, employees, wages, passengers, and freight carried.

<sup>2</sup> Does not include employees or wages for yachts.

<sup>3</sup> Decrease.

<sup>4</sup> Income, employees, and wages were not reported for canal boats at the census of 1889, and therefore the per cent of increase is not given.

Vessels were classified according to the waters on which they operated principally in 1906, and not according to the port at which they were documented, which was the rule in 1889. The coasts and tributary rivers up to what is generally known as the "head of navigation" are included in the "Atlantic coast and Gulf of Mexico" and the "Pacific coast." The Missis-

sippi river is an exception, the entire river system being included under "Mississippi river and its tributaries." The division "all other inland waters" includes vessels operating on waters not otherwise classified.

All classes of craft are covered by this table and the statistics represent the entire floating equipment included in the census for each of the five divisions. By

far the largest proportion of American shipping operates on the Atlantic coast and the Gulf of Mexico, and the greatest increases in number, tonnage, value, and the other items shown in the table are reported for these waters. The next greatest number and tonnage are shown for the Mississippi river and its tributaries. The total for these rivers includes the figures for a large number of coal barges and similar craft, which increase the total number and tonnage out of proportion to the value and amount of business done; the smaller number and tonnage reported for the Great Lakes and St. Lawrence river represent a much greater value, and their gross earnings for the census of 1906 was almost four times as great as the income of the vessels on the Mississippi. The largest percentage of increase in all items covered by the table, except number of vessels, gross tonnage, and passengers carried, is shown for the shipping on the Pacific coast.

While the comparison of the data for the two census years indicates an increase in the total for all varieties of shipping on the Mississippi and its tributaries, the increase is not as great as in the other divisions, and

there has been apparently a decrease in the number of employees. A consideration of the statistics given in Tables 5 to 17 for the different classes of vessels in each division permits a better understanding of the general totals for the divisions.

DIAGRAM 3.—Gross tonnage of all vessels: 1906.

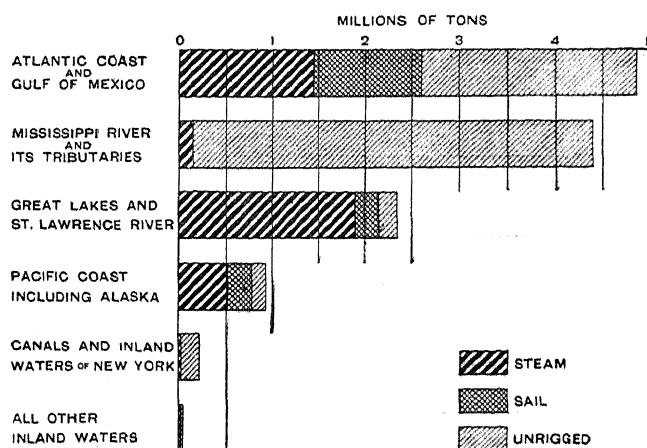
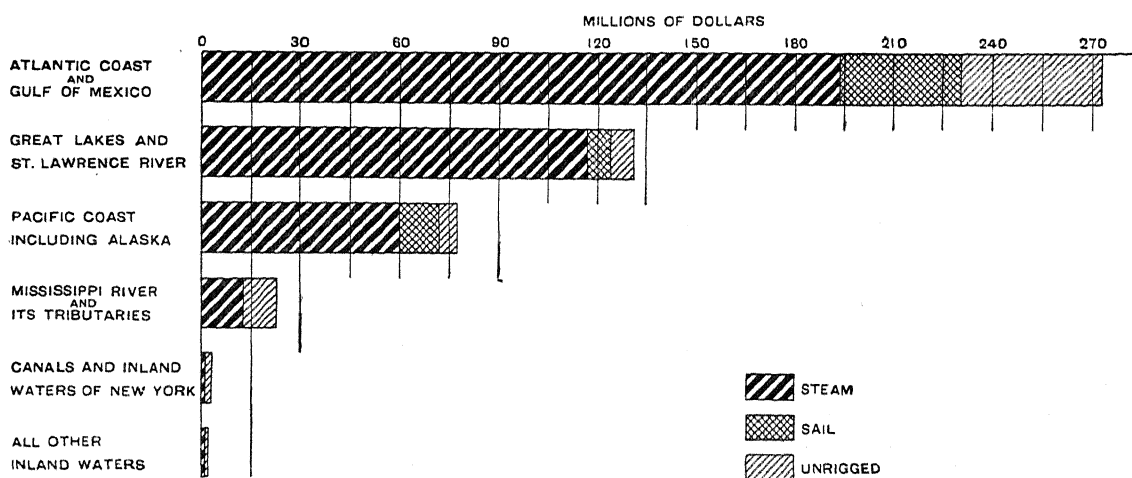


DIAGRAM 4.—VALUE OF ALL VESSELS: 1906.



#### OWNERSHIP OF VESSELS.

To show the relative importance of the vessels operating under the different forms of ownership statistics are presented for the following classes: (1) Individual, (2) firm, (3) incorporated company, and (4) "miscellaneous," which embraces craft owned by pilot and cooperative associations, those operated by local governments, etc.

At the census of 1889 the statistics of ownership were limited to the number, tonnage, and value of the ves-

sels operating on the Atlantic coast and Gulf of Mexico and on the Pacific coast. The totals were shown for individual ownership, joint-stock companies, and corporations. But as it can not be determined definitely whether vessels owned by firms were included with those owned by joint-stock companies or with those owned by individuals, in comparing the statistics for these two divisions data are given only for corporate companies and for all other forms of ownership combined.



TABLE 22.—OWNERSHIP FOR STEAM AND SAIL VESSELS ON THE ATLANTIC COAST AND GULF OF MEXICO AND THE PACIFIC COAST: 1906 AND 1889.

	VESSELS.				TONNAGE.				VALUE OF VESSELS.			
	Number.		Per cent of total.		Gross tons.		Per cent of total.		Amount.		Per cent of total.	
	1906	1889	1906	1889	1906	1889	1906	1889	1906	1889	1906	1889
Atlantic coast and Gulf of Mexico: Steam and sail.....	11,333	8,813	100.0	100.0	2,590,799	2,034,962	100.0	100.0	\$231,447,230	\$108,204,622	100.0	100.0
Incorporated company.....	2,630	1,019	23.2	11.6	1,644,044	571,181	63.5	28.1	167,929,716	43,376,790	72.6	40.1
All other forms of ownership.....	8,703	7,794	76.8	88.4	946,755	1,463,781	36.5	71.9	63,517,514	64,827,832	27.4	59.9
Steam.....	5,413	2,536	100.0	100.0	1,457,894	741,770	100.0	100.0	193,926,327	65,518,640	100.0	100.0
Incorporated company.....	2,072	917	38.3	36.2	1,244,283	545,683	85.3	73.6	155,819,420	42,892,910	80.3	65.5
All other forms of ownership.....	3,341	1,619	61.7	63.8	213,611	196,087	14.7	26.4	38,106,907	22,625,730	19.7	34.5
Sail.....	5,920	6,277	100.0	100.0	1,132,905	1,293,192	100.0	100.0	37,520,903	42,685,982	100.0	100.0
Incorporated company.....	558	102	9.4	1.6	399,761	25,498	35.3	2.0	12,110,296	483,880	32.3	1.1
All other forms of ownership.....	5,362	6,175	90.6	98.4	733,144	1,267,694	64.7	98.0	25,410,607	42,202,102	67.7	98.9
Pacific coast (including Alaska): Steam and sail.....	1,732	1,146	100.0	100.0	823,390	355,801	100.0	100.0	71,973,316	20,998,695	100.0	100.0
Incorporated company.....	796	281	46.0	24.5	637,571	164,398	77.4	46.2	61,426,691	12,313,110	85.3	58.6
All other forms of ownership.....	936	865	54.0	75.5	185,819	191,403	22.6	53.8	10,546,625	8,685,585	14.7	41.4
Steam.....	1,066	465	100.0	100.0	518,107	160,293	100.0	100.0	60,440,145	14,767,355	100.0	100.0
Incorporated company.....	609	221	57.1	47.5	477,815	127,498	92.2	79.5	55,560,485	11,575,605	91.9	78.4
All other forms of ownership.....	457	244	42.9	52.5	40,292	32,795	7.8	20.5	4,879,660	3,191,750	8.1	21.6
Sail.....	666	681	100.0	100.0	305,283	195,508	100.0	100.0	11,533,171	6,231,340	100.0	100.0
Incorporated company.....	187	60	28.1	8.8	159,756	36,900	52.3	18.9	5,866,296	737,505	50.9	11.8
All other forms of ownership.....	479	621	71.9	91.2	145,527	158,608	47.7	81.1	5,666,965	5,493,835	49.1	88.2

The table indicates that at the census of 1906 vessels operated by corporations constituted a much larger proportion of the total number than at the census of 1889, and corresponding increases in relative importance are shown for their tonnage and value. In 1889 corporations controlled 28.1 per cent of the tonnage operating on the Atlantic coast and 46.2 per cent of that operating on the Pacific coast; in 1906 these proportions had increased to 63.5 and 77.4 per cent, respectively. Of the number, tonnage, and value of steam vessels, the proportion under corporation control was larger at both censuses than the corresponding proportions for sailing craft, although the table shows that there has been a large increase in the percentage of sail vessels operating under this form of ownership. Small craft are, as a rule, owned by individuals or firms, and large numbers of them operate on the Atlantic coast, where vessels owned by corporations represent a considerably smaller proportion of the total than on the Pacific coast.

TABLE 23.—Number, gross tonnage, and value of vessels, by character of ownership, with per cent in each class: 1906.

OWNERSHIP.	VESSELS.		TONNAGE.		VALUE OF VESSELS.	
	Number.	Per cent.	Gross tons.	Per cent.	Amount.	Per cent.
Total.....	37,321	100.0	12,893,429	100.0	\$507,973,121	100.0
Individual.....	12,944	34.7	1,462,818	11.3	65,833,525	13.0
Firm.....	4,169	11.2	929,311	7.2	28,807,734	5.7
Incorporated company.....	19,729	52.9	10,375,681	80.5	402,419,557	79.2
Miscellaneous.....	479	1.3	125,619	0.9	10,912,305	2.1

*Individual ownership.*—The average tonnage of the 12,944 vessels owned by individuals was 113 as compared with an average of 223 tons for those owned by firms, and 526 tons for the vessels operated by corporations. Many of the yachts are of greater value per ton than other classes of craft, with the result that this group represents a larger percentage of the total value than of the total tonnage. Comparatively few individual owners, however, operate very large craft, so that while they still control more than a third of the vessels, the tonnage and value of these craft are but slightly more than one-tenth of the totals for all craft.

*Firm.*—This class includes all vessels operated by firms and partnerships, whether general or limited, and all those operated by shareholders, though there may be no formal articles of partnership. While the average tonnage of the 4,169 vessels included in the group is considerably larger than the average for "individuals," the total number, tonnage, and value is much less; and with the exception of the miscellaneous group, this form of ownership represents the smallest proportion of the floating equipment.

*Incorporated company.*—The principal industries of the country owe their great development very largely to the influence of corporations. The advantages of this form of organization for the conduct of large enterprises were early recognized by the shipping interests and are now well established. The large capital required for the construction and maintenance

of the lines of freight and passenger steamers operating on the coasts and inland waters was most readily secured through the corporate form of ownership, which enables numerous individuals to contribute, and renders it possible to secure the advantage of the economies made practicable by the concentration of management and the continuity of existence that are incident to the corporation. Of the 37,321 vessels included in the census of 1906, corporations owned more than one-half, representing more than three-fourths both of the tonnage and of the value of the merchant marine; of all steam vessels, they con-

trolled 42.6 per cent, representing 87.6 per cent of the gross steam tonnage; and of the regular freight and passenger vessels, they controlled 56.8 per cent of the number with 91 per cent of the tonnage. Steam yachts in fact are the only class of steam craft in which corporations do not own the larger portion of the gross tonnage.

Sailing vessels are more evenly distributed among the different forms of ownership, but corporations own 43.6 per cent of the tonnage of the regular freight sailing vessels, while of the unrigged tonnage, they control 85.4 per cent.

TABLE 24.—NUMBER AND TONNAGE OF VESSELS, BY CHARACTER OF OWNERSHIP AND BY OCCUPATION: 1906.

OCCUPATION.	TOTAL.		INDIVIDUAL.		FIRM.		INCORPORATED COMPANY.		MISCELLANEOUS.	
	Number of vessels.	Gross tonnage.	Number of vessels.	Gross tonnage.	Number of vessels.	Gross tonnage.	Number of vessels.	Gross tonnage.	Number of vessels.	Gross tonnage.
Total.....	37,321	12,893,429	12,944	1,462,818	4,169	929,311	19,729	10,375,681	479	125,619
Steam.....	9,927	4,059,521	4,359	316,219	1,141	145,326	4,234	3,555,040	203	42,936
Freight and passenger.....	3,615	3,411,588	1,101	189,707	437	113,611	2,055	3,104,291	22	3,979
Tugs and other towing vessels.....	3,079	261,375	902	37,079	488	25,286	1,044	192,313	45	6,697
Ferryboats.....	536	261,073	115	5,423	39	1,752	352	233,630	30	20,268
Yachts.....	2,176	82,275	1,978	78,188	130	2,415	55	1,500	13	172
All other.....	521	43,210	263	5,822	47	2,262	118	23,306	93	11,820
Sail.....	7,131	1,704,277	4,772	483,850	1,403	435,756	857	729,784	99	54,878
Freight and passenger.....	5,181	1,672,862	3,028	457,877	1,252	433,412	840	728,714	61	52,859
Yachts.....	1,594	24,155	1,461	22,540	116	1,310	9	161	8	144
All other.....	356	7,260	283	3,442	35	1,034	8	909	30	1,875
Unrigged.....	20,263	7,129,631	3,813	662,740	1,625	348,229	14,648	6,090,857	177	27,805

*Miscellaneous.*—This class includes all craft that could not be assigned to any of the other forms of ownership. They represent less than 1 per cent of the total tonnage, and are not as a rule connected with the movement of freight and passengers. The majority of them are owned by local governments and cooperative associations.

#### CONSTRUCTION.

Iron was first used in marine construction about 1800, when a small canal boat was built in England with wooden frames and planked with boiler iron, and this marked the advent of the metal shipbuilding of the present day. In 1821, at Horsley, England, was built the first iron steamboat, a small vessel intended for river service. For nearly a decade iron construction was confined to vessels intended for river and inland service, but about the year 1838 iron sailing vessels of from 200 to 300 tons were being built for ocean voyages. So far as England is concerned this period marks the increase in iron construction and the decrease in that from wood.<sup>1</sup>

The first record of an iron vessel in the United States is in 1825, when a small iron steamboat was launched on the Susquehanna river, in Pennsylvania.<sup>1</sup> The exact dates of the launching of other iron vessels are uncertain, but the abundance and cheapness of wood have retarded metal shipbuilding in this country.

<sup>1</sup> Tenth Census. Report on Shipbuilding Industry.

TABLE 25.—Shipbuilding—value of new construction: 1880 to 1905.<sup>1</sup>

CENSUS.	Total.	Iron and steel.	Wood.	Per cent of increase, iron and steel.	Per cent of increase, wood.
1905.....	\$53,119,935	\$43,395,704	\$9,724,231	70.5	* 5.5
Per cent.....		81.7	18.3		
1900.....	35,750,473	25,454,943	10,295,530	120.4	* 20.4
Per cent.....		71.2	28.8		
1890.....	24,483,995	11,550,846	12,933,149	126.6	* 8.5
Per cent.....		47.2	52.8		
1880.....	19,225,714	5,096,293	14,129,421		
Per cent.....		26.5	73.5		

<sup>1</sup> Census of Manufactures, 1905, Shipbuilding.

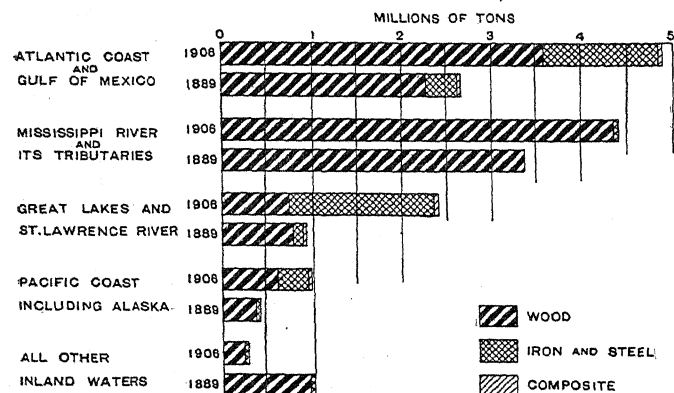
\* Decrease.

The statistics in this table were obtained from the Census reports on manufactures, and as the report of 1880 was the first at which the construction of iron and steel and of wooden vessels were reported separately, comparative figures begin with that date. The percentages shown in this table bring out very clearly the advance in iron and steel construction and the decrease in wooden shipbuilding. During the period covered there was a constant increase in construction of the former class from a value of \$5,096,293, representing 26.5 per cent of the total value of new construction reported in 1880, to \$43,395,704, or 81.7 per cent, in 1905. On the other hand, wooden construction, which was valued at \$14,129,421, or 73.5



per cent of the total in 1880, fell to \$9,724,231, or 18.3 per cent, in 1905.

DIAGRAM 5.—Gross tonnage of all vessels, by character of construction: 1906.



The decrease in wood as a material of construction is due largely to the superior advantages possessed by iron and steel (or at the present time more particularly by steel, since the use of iron for this purpose has practically ceased). Among these may be mentioned lightness and buoyancy of hull and a somewhat greater cargo capacity for vessels of a corresponding tonnage. The life of the metal vessel is very much greater, the rate of insurance considerably less, and as a rule a smaller outlay for repairs is required.

The census of water transportation contains no information in regard to the initial cost of constructing vessels. While the statistics of valuation may be used as a factor to determine the relative importance of the metal and the wooden vessels, the number and gross tonnage are considered more reliable data in determining the increase or decrease.

TABLE 26.—NUMBER, GROSS TONNAGE, AND VALUE OF VESSELS IN EACH DIVISION, BY CHARACTER OF CONSTRUCTION, WITH PER CENT OF INCREASE: 1906 AND 1889.

DIVISION.	Census.	TOTAL.			IRON AND STEEL.			WOOD.			COMPOSITE.		
		Number of vessels.	Gross tonnage.	Value of vessels.	Number of vessels.	Gross tonnage.	Value of vessels.	Number of vessels.	Gross tonnage.	Value of vessels.	Number of vessels.	Gross tonnage.	Value of vessels.
Total.....	1906	37,321	12,893,429	\$507,973,121	1,979	3,276,723	\$306,229,289	35,247	9,581,348	\$199,135,582	95	35,358	\$2,608,250
	1889	30,485	8,359,135	206,992,352	548	525,218	50,918,319	29,834	7,793,259	153,552,913	103	40,658	2,521,120
Per cent of increase.....		22.4	54.2	145.4	261.1	523.9	501.4	18.1	22.9	29.7	17.8	13.0	3.4
Atlantic coast and Gulf of Mexico. <sup>2</sup>	1906	20,032	4,851,421	273,105,915	1,148	1,247,838	155,776,134	18,827	3,591,278	115,877,581	57	12,305	1,452,200
	1889	12,238	2,658,445	116,042,062	434	364,283	33,622,030	11,714	2,269,558	81,236,912	90	24,604	1,183,120
Per cent of increase.....		63.7	82.5	135.4	164.5	242.5	363.3	60.7	58.2	42.6	136.7	50.0	22.7
Pacific coast (including Alaska). <sup>2</sup>	1906	2,537	977,687	76,622,633	130	354,134	41,375,742	2,404	622,606	35,168,891	3	947	78,000
	1889	1,635	419,157	21,824,040	23	48,121	6,613,065	1,610	369,738	15,100,975	2	1,298	110,000
Per cent of increase.....		55.2	133.2	251.1	465.2	635.9	525.7	49.3	68.4	132.9	50.0	127.0	29.1
Great Lakes and St. Lawrence river.	1906	2,990	2,392,863	130,805,640	572	1,634,153	105,729,416	2,391	737,386	24,075,474	27	21,324	1,000,750
	1889	2,737	920,294	48,580,174	85	111,410	10,574,224	2,641	794,128	36,777,950	11	14,756	1,228,000
Per cent of increase.....		9.2	160.6	169.2	572.9	1,366.8	899.9	9.5	7.1	34.5	145.4	44.5	18.5
Mississippi river and its tributaries. <sup>3</sup>	1906	9,622	4,411,967	22,852,142	107	33,893	2,580,682	9,513	4,377,480	20,213,460	2	594	58,000
	1889	7,300	3,364,610	14,407,162	.....	.....	.....	7,300	3,364,610	14,407,162	.....	.....	.....
Per cent of increase.....		31.8	31.1	58.6	.....	.....	.....	30.3	30.1	40.3	.....	.....	.....
All other inland waters. <sup>4</sup>	1906	2,140	259,491	4,586,791	22	6,705	767,315	2,112	252,598	3,800,176	6	188	19,300
	1889	6,575	996,629	6,138,914	6	1,404	109,000	6,569	995,225	6,029,914	.....	.....	.....
Per cent of increase.....		167.4	74.0	25.3	266.7	377.6	604.0	167.8	174.6	137.0	.....	.....	.....

<sup>1</sup> Decrease.

<sup>2</sup> The character of construction of unrigged craft was not reported in 1889, but for purposes of comparison in this table all were assumed to be of wood.

<sup>3</sup> The character of construction was not reported in 1889, but for purposes of comparison in this table all vessels were assumed to be of wood.

<sup>4</sup> The character of construction was not reported for 14 vessels operating on the Red River (of the North) and 6,514 canal boats in 1889, but for purposes of comparison in this table all of these were assumed to be of wood.

There were very few unrigged craft of metal construction in 1889, and as the statistics for them were not shown separately at that census they are all included as "wood" in this table; all the vessels operating on the Mississippi river and its tributaries in 1889 are also considered as being of wood construction. The inclusion of these two groups as wooden craft has tended to increase slightly the totals for such vessels in 1889, but it is believed that the number, tonnage, and value of the metal vessels included were so small that they would have no appreciable effect on the percentages.

Although in 1906, as in 1889, much the largest proportion of the tonnage of the merchant marine was still of wood construction, in 1906, the gross tonnage reported for vessels constructed of iron or steel had increased 2,751,505 gross tons, or 523.9 per cent. The

increase in wood construction was very much less, being actually 1,788,089 gross tons, or 22.9 per cent. Vessels of composite construction decreased by 5,300 tons. The most notable increase in iron and steel tonnage occurred on the Great Lakes, where there was a gain of 1,522,743 gross tons, accompanied by an actual decrease of 56,742 gross tons for wooden vessels. The largest increase in the gross tonnage of wooden vessels—1,321,720 tons—is shown for the Atlantic coast. Of the total gross tonnage reported for 1906, 3,276,723 tons, or 25.4 per cent, was for vessels of iron or steel construction; 9,581,348 tons, or 74.3 per cent, for wooden vessels; and 35,358 tons, or three-tenths of 1 per cent, for vessels of composite construction.

The number, tonnage, and value of the different classes of vessels, grouped according to the character of construction, are given in Table 27.

TABLE 27.—VESSELS OF EACH OCCUPATION IN EACH DIVISION, GROUPED BY CHARACTER OF CONSTRUCTION: 1906.

OCCUPATION AND DIVISION.	TOTAL.			IRON.			STEEL.			WOOD.			COMPOSITE.		
	Number of vessels.	Gross tonnage.	Value of vessels.	Number of vessels.	Gross tonnage.	Value of vessels.	Number of vessels.	Gross tonnage.	Value of vessels.	Number of vessels.	Gross tonnage.	Value of vessels.	Number of vessels.	Gross tonnage.	Value of vessels.
<b>STEAM.</b>															
Freight and passenger.....	3,615	3,411,588	\$286,218,089	218	314,107	\$29,361,787	690	2,300,444	\$209,113,544	2,690	768,857	\$46,634,758	17	19,180	\$1,108,000
Atlantic coast and Gulf of Mexico...	1,523	1,045,811	121,136,485	156	194,638	17,735,465	239	654,431	86,647,264	1,123	193,987	16,563,756	5	2,755	190,000
Pacific coast (including Alaska)....	604	451,270	52,164,977	37	92,378	9,756,072	49	220,839	28,796,941	517	137,634	13,561,964	1	419	50,000
Great Lakes and St. Lawrence river.	932	1,842,251	107,897,440	24	27,041	1,865,750	388	1,426,876	92,862,714	510	372,453	12,308,976	10	15,881	800,000
Mississippi river and its tributaries.	390	55,779	3,737,450	1	50	4,500	9	2,912	317,000	379	52,692	3,407,950	1	125	8,000
Canals and other inland waters of New York state.....	79	11,521	898,500				5	4,386	489,625	74	7,135	408,875			
All other inland waters.....	87	4,956	383,237							87	4,956	383,237			
Tugs and other towing vessels.....	3,079	261,375	39,062,249	169	20,395	3,683,955	251	63,507	10,890,462	2,649	176,513	24,383,332	10	960	104,500
Atlantic coast and Gulf of Mexico...	1,690	148,992	25,894,551	140	17,685	3,185,940	183	52,449	8,869,821	1,363	78,582	13,808,790	4	276	30,000
Pacific coast (including Alaska)....	313	24,151	3,353,927	4	804	205,727	10	1,078	417,467	299	21,669	2,730,733			
Great Lakes and St. Lawrence river.	382	22,663	2,630,097	6	394	34,300	33	3,872	568,729	342	18,242	2,017,068	1	155	10,000
Mississippi river and its tributaries.	619	62,836	6,822,210	18	1,398	245,988	22	5,088	954,445	578	55,881	5,571,777	1	469	50,000
Canals and other inland waters of New York state.....	38	1,868	222,812	1	114	12,000	3	420	80,000	32	1,295	120,812	2	39	10,000
All other inland waters.....	37	865	138,652							35	844	134,152	2	21	4,500
Ferryboats.....	536	261,073	29,578,380	64	43,513	5,978,517	92	107,893	13,861,081	379	109,253	9,715,782	1	414	23,000
Atlantic coast and Gulf of Mexico...	270	102,834	19,970,466	61	42,996	5,893,517	66	71,502	10,078,250	143	48,336	3,998,699			
Pacific coast (including Alaska)....	47	40,171	4,315,522				2	2,964	450,000	44	36,793	3,842,522	1	414	23,000
Great Lakes and St. Lawrence river.	48	35,581	3,429,532				14	27,368	2,708,087	34	8,213	631,445			
Mississippi river and its tributaries.	166	22,180	1,776,360	3	517	85,000	10	6,059	534,744	153	15,604	1,156,616			
Canals and other inland waters of New York state.....	2	97	6,500							2	97	6,500			
All other inland waters.....	3	210	80,000							3	210	80,000			
Yachts.....	2,176	82,275	24,281,861	13	2,121	512,000	121	36,173	12,012,020	2,016	41,643	11,036,641	26	2,338	721,200
Atlantic coast and Gulf of Mexico...	1,577	70,461	21,290,339	9	1,754	383,000	98	34,615	11,424,070	1,449	31,944	8,797,269	21	2,148	686,000
Pacific coast (including Alaska)....	66	1,065	204,800				1	102	17,000	65	963	277,800			
Great Lakes and St. Lawrence river.	236	6,210	1,673,000	2	317	95,000	10	955	421,750	220	4,773	1,125,050	4	105	31,200
Mississippi river and its tributaries.	222	3,255	563,400	2	50	34,000	9	318	57,500	211	2,887	471,900			
Canals and other inland waters of New York state.....	32	641	262,700				1	146	75,000	31	495	187,700			
All other inland waters.....	43	643	197,622				2	37	16,700	40	581	176,922	1	25	4,000
All other.....	521	43,210	7,632,148	21	5,193	938,800	35	14,171	3,337,272	463	23,193	3,256,076	2	653	100,000
Atlantic coast and Gulf of Mexico...	353	29,796	5,634,486	19	5,066	888,800	22	11,310	2,534,150	310	12,767	2,111,536	2	653	100,000
Pacific coast (including Alaska)....	36	1,450	310,919	1	27	15,000	1	203	44,329	34	1,220	251,500			
Great Lakes and St. Lawrence river.	78	9,081	1,353,743				12	2,658	758,793	66	6,423	594,950			
Mississippi river and its tributaries.	38	2,177	297,350	1	100	35,000				37	2,077	262,350			
Canals and other inland waters of New York state.....															
All other inland waters.....	16	706	35,650							16	706	35,650			
<b>SAIL.</b>															
Freight and passenger.....	5,181	1,672,862	51,415,756	34	40,345	1,751,471	76	185,268	8,080,980	5,069	1,442,556	41,347,305	2	4,693	236,000
Atlantic coast and Gulf of Mexico...	4,227	1,105,901	33,213,849	22	23,639	785,471	35	58,831	2,803,315	4,168	1,018,738	29,389,063	2	4,693	236,000
Pacific coast (including Alaska)....	547	302,798	11,275,586	12	16,706	966,000	8	15,142	676,206	527	270,950	9,633,380			
Great Lakes and St. Lawrence river.	403	263,837	6,924,071				33	111,295	4,601,459	370	152,542	2,322,612			
Mississippi river and its tributaries.															
Canals and other inland waters of New York state.....	4	326	2,250							4	326	2,250			
All other inland waters.....															
Yachts.....	1,504	24,155	4,169,253	3	209	51,000	18	2,137	715,300	1,549	20,954	3,202,453	24	855	200,500
Atlantic coast and Gulf of Mexico...	1,358	21,046	3,775,743	2	134	21,000	17	2,122	714,000	1,317	17,958	2,842,543	22	832	198,200
Pacific coast (including Alaska)....	104	1,459	174,110							104	1,459	174,110			
Great Lakes and St. Lawrence river.	122	1,458	204,850	1	75	30,000	1	15	1,300	118	1,345	171,250	2	23	2,300
Mississippi river and its tributaries.															
Canals and other inland waters of New York state.....	9	169	13,750							9	169	13,750			
All other inland waters.....	1	23	800							1	23	800			
All other.....	356	7,260	621,136							355	7,146	616,136	1	114	5,000
Atlantic coast and Gulf of Mexico...	335	5,958	531,311							335	5,958	531,311			
Pacific coast (including Alaska)....	15	1,026	83,475							14	912	78,475	1	114	5,000
Great Lakes and St. Lawrence river.	6	276	6,350							6	276	6,350			
Mississippi river and its tributaries.															
Canals and other inland waters of New York state.....															
All other inland waters.....															
<b>UNRIGGED.</b>															
Canal boats.....	2,237	303,581	2,952,197				9	602	18,500	2,227	302,876	2,932,807	1	103	800
Atlantic coast and Gulf of Mexico...	663	103,877	1,112,475							663	103,877	1,112,475			
Pacific coast (including Alaska)....															
Great Lakes and St. Lawrence river.	6	1,134	13,800							6	1,134	13,800			
Mississippi river and its tributaries.	2	323	4,100							2	323	4,100			
Canals and other inland waters of New York state.....	1,364	173,388	1,583,835							1,363	173,285	1,583,035	1	103	800
All other inland waters.....	202	24,859	237,987				9	602	18,500	193	24,257	219,487			
All other.....	18,026	6,826,050	62,042,052	9	5,678	78,850	156	125,967	5,843,750	17,850	6,688,357	56,010,202	11	6,048	109,250
Atlantic coast and Gulf of Mexico...	8,036	2,156,745	40,546,210	5	2,520	27,350	74	74,146	3,784,721	7,956	2,079,131	36,722,139	1	948	12,000
Pacific coast (including Alaska)....	805	154,297	4,649,517	3	2,525	19,000		766	12,000	800	151,006	4,618,317			
Great Lakes and St. Lawrence river.	777	210,372	6,672,757				48	33,287	1,691,534	719	171,985	4,883,973	10	5,100	97,250
Mississippi river and its tributaries.	8,185	4,265,417	9,651,272	1	633	32,500	31	16,768	280,005	8,153	4,248,016	9,338,767			
Canals and other inland waters of New York state.....	147	30,517	343,874				1	1,000	75,490	146	29,517	268,384			
All other inland waters.....	76	8,702	178,622							76	8,702	178,622			

The separation of the statistics for iron and steel vessels results in showing the great importance of steel tonnage as compared with that of iron, wood, or composite materials. Of the gross tonnage of 3,411,588 reported for the steam passenger and freight vessels, 2,309,444 tons, or 67.7 per cent, was for vessels of steel construction. While the importance of steel tonnage is not so pronounced for some of the other classes of vessels, it represents 24.3 per cent of the total gross tonnage for tugs and 41.3 per cent of that for ferryboats. A large proportion also of the tonnage of yachts on the Atlantic coast is of steel construction.

Vessels of wooden construction still predominate among the sailing craft and represent 86.2 per cent of the gross tonnage for the freight and passenger vessels. The 33 freight and passenger steel sailing vessels of 111,295 gross tons on the Great Lakes are almost all schooner barges, which, as explained on page 14, are included as sail rather than as unrigged craft.

The great preponderance of wooden tonnage among the unrigged craft is due partly to the class of work in which these craft are employed, and also to the fact that large numbers of them are controlled by small owners who can not command the capital required for the operation of vessels constructed of more expensive material.

The increase or decrease in the relative importance of metal and wooden tonnage in the different divisions is shown in Table 28.

TABLE 28.—Per cent of gross tonnage of iron and steel, wood, and composite vessels, by divisions: 1906 and 1889.

DIVISION.	Census.	Total.	Iron and steel.	Wood.	Composite.
Total.....	1906 1889	100.0 100.0	25.4 6.3	74.3 93.2	0.3 0.5
Atlantic coast and Gulf of Mexico <sup>1</sup> .....	1906 1889	100.0 100.0	25.7 13.7	74.0 85.4	0.2 0.9
Pacific coast (including Alaska) <sup>1</sup> .....	1906 1889	100.0 100.0	36.2 11.5	63.7 88.2	0.1 0.3
Great Lakes and St. Lawrence river.....	1906 1889	100.0 100.0	68.3 12.1	30.8 86.3	0.9 1.6
Mississippi river and its tributaries. <sup>2</sup>	1906 1889	100.0 100.0	0.8 .....	99.2 100.0	(*) .....
All other inland waters <sup>4</sup> .....	1906 1889	100.0 100.0	2.6 0.1	97.3 99.9	0.1 .....

<sup>1</sup> The character of construction of unrigged craft was not reported in 1889, but for purposes of comparison in this table they were all assumed to be of wood.

<sup>2</sup> The character of construction was not reported in 1889, but for purposes of comparison in this table all vessels were assumed to be of wood.

<sup>3</sup> Less than one-tenth of 1 per cent.

<sup>4</sup> The character of construction was not reported for 14 vessels operating on the Red River (of the North) and 6,514 canal boats in 1889, but for purposes of comparison in this table all of these were assumed to be of wood.

#### NUMBER AND TONNAGE OF VESSELS.

The individual craft was the unit of the Census enumeration, and the tonnage, which was reported for each craft, is the safest unit of measurement to determine their size and relative importance. "Five tons net register" represented the minimum size of craft included in the census. This term as used for Census

purposes means a vessel the internal cubical contents of which are 500 cubic feet, excluding machinery and space occupied by the crew, or in the case of a vessel not documented it was construed to mean a vessel carrying 10 tons of cargo of 2,000 pounds each. Both the gross and net tonnage were reported, and for all documented vessels it was possible to make a correct report of the two kinds of tonnage. For undocumented vessels, for which the actual tonnage had not been ascertained, an estimate was accepted, and it was impossible, in many instances, to obtain a satisfactory report of the net as distinguished from the gross tonnage.

In steam vessels the space required for boilers, engines, and various superstructures reduces the percentage of net tonnage, though there is considerable variation in the proportion for the different classes of craft. There being less space required for this purpose in sailing vessels, the percentage of net tonnage is larger, and it is still larger for the unrigged craft.

TABLE 29.—Gross and net tonnage, with per cent net is of gross tonnage, by class of vessels: 1906.

CLASS.	Gross tonnage.	NET TONNAGE.	
		Number of tons.	Per cent of gross tonnage.
Total.....	12,893,429	11,484,833	89.1
Steam.....	4,059,521	2,918,476	71.9
Freight and passenger.....	3,411,588	2,474,183	72.5
Tugs and other towing vessels.....	261,375	174,373	66.7
Ferryboats.....	261,073	187,238	71.7
Yachts.....	82,275	54,123	65.8
All other.....	43,210	28,559	66.1
Sail.....	1,704,277	1,539,513	90.3
Freight and passenger.....	1,672,862	1,510,658	90.3
Yachts.....	24,155	22,176	91.8
All other.....	7,260	6,679	92.0
Unrigged.....	7,129,631	7,026,844	98.6
Canal boats.....	303,581	292,386	96.3
All other.....	6,826,050	6,734,458	98.6

While this table indicates that the proportion which the net tonnage, as reported to the Census, constitutes of the gross tonnage is fairly consistent for the different classes of vessels, it is believed that the figures for gross tonnage are the more reliable; they are therefore used in all other tables of this report.

The limitation in size as established by the tonnage can be applied under all conditions, and the rule for the exclusion of the small craft was followed in all sections of the country. At the census of 1889 the rather indefinite term "of over 5 tons burden" was used to designate the minimum limit in the size of the vessels to be included, and while it is believed that this was construed to mean 5 "gross" tons, there is no positive statement that this rule was followed in the canvass for all sections of the country. To avoid the possibility of any misunderstanding, the term "5 tons net register" was adopted for the census of 1906.

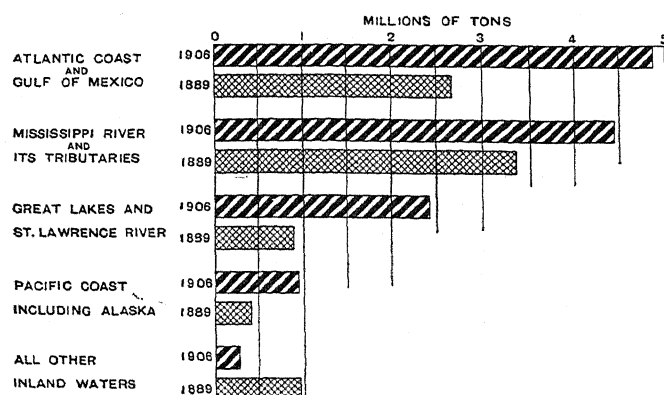
TABLE 30.—NUMBER, GROSS TONNAGE, AND VALUE OF DIFFERENT CLASSES OF VESSELS, BY DIVISIONS:  
1906 AND 1889.

DIVISION AND CLASS.	Census.	Number of vessels.	Gross tonnage.	Value of vessels.	Average tonnage per vessel.	Average value per ton.	Average value per vessel.
Total.....	1906 1889	37,321 30,485	12,893,429 8,350,135	\$507,973,121 206,992,352	345 274	\$39 25	\$13,611 6,790
Steam.....	1906 1889	9,927 5,603	4,050,521 1,710,073	386,772,727 131,567,427	409 305	95 77	38,962 23,482
Sail.....	1906 1889	7,131 7,945	1,704,277 1,675,706	56,206,145 53,192,972	239 211	33 32	7,882 6,695
Unrigged.....	1906 1889	20,263 16,937	7,129,631 4,973,356	64,994,249 22,231,953	352 294	9 4	3,208 1,313
Atlantic coast and Gulf of Mexico.....	1906 1889	20,032 12,238	4,851,421 2,658,445	273,105,915 116,042,062	242 217	56 44	13,633 9,482
Steam.....	1906 1889	5,413 2,536	1,457,894 741,770	193,926,327 65,518,640	269 292	133 88	35,826 25,835
Sail.....	1906 1889	5,920 6,277	1,132,905 1,293,192	37,520,903 42,685,982	191 206	33 33	6,338 6,800
Unrigged.....	1906 1889	8,699 3,425	2,260,622 623,483	41,658,685 7,837,440	260 182	18 12	4,789 2,288
Pacific coast (including Alaska).....	1906 1889	2,537 1,635	977,687 419,157	76,622,633 21,824,040	385 256	78 52	30,202 13,348
Steam.....	1906 1889	1,066 405	518,107 160,293	60,440,145 14,767,355	486 345	117 92	56,698 31,758
Sail.....	1906 1889	666 681	305,283 195,508	11,533,171 6,231,340	458 287	38 32	17,317 9,150
Unrigged.....	1906 1889	805 489	154,297 63,356	4,649,317 825,345	192 130	30 13	5,776 1,688
Great Lakes and St. Lawrence river.....	1906 1889	2,990 2,737	2,362,863 920,294	130,805,640 48,580,174	800 336	55 53	43,748 17,749
Steam.....	1906 1889	1,676 1,467	1,915,786 595,813	116,983,812 40,868,824	1,143 406	61 68	69,799 27,859
Sail.....	1906 1889	531 902	265,671 185,081	7,135,271 4,238,850	500 192	27 23	13,437 4,406
Unrigged.....	1906 1889	783 308	211,506 139,400	6,686,557 3,472,500	270 452	32 25	8,540 11,274
Mississippi river and its tributaries.....	1906 1889	9,622 7,300	4,411,967 3,304,610	22,852,142 14,407,162	458 461	5 4	2,375 1,974
Steam.....	1906 1889	1,435 972	146,227 192,974	13,196,770 9,622,608	102 198	90 50	9,196 9,900
Unrigged.....	1906 1889	8,187 6,328	4,265,740 3,171,636	9,655,372 4,784,554	521 501	2 2	1,179 750
All other inland waters.....	1906 1889	2,140 6,575	259,491 996,029	4,586,791 6,138,914	121 152	18 6	2,143 934
Steam.....	1906 1889	337 163	21,507 19,223	2,225,673 790,000	64 118	103 41	6,604 4,847
Sail.....	1906 1889	14 25	518 1,925	16,800 36,800	37 77	32 19	1,200 1,472
Unrigged.....	1906 1889	1,789 6,387	237,466 975,481	2,344,318 5,312,114	133 153	10 5	1,310 832

The average gross tonnage per vessel increased from 274 in 1889 to 345 in 1906, but there is a great variety of craft represented by the figures on which these averages are based. While the average tonnage for the different classes shown in the table is of greater significance, each class embraces a large number of small craft that are used neither for freight nor for passenger traffic, and which are not usually considered in connection with the average tonnage or the average value per vessel or per ton of the merchant

marine. These craft form a much smaller proportion of the vessels operating on the Great Lakes than of those for the other waters. This circumstance and the recent construction of a number of vessels of large tonnage designed especially for a particular class of freight have greatly increased the average size of the vessels in this section, so that it is now considerably larger than the general average for any of the other divisions.

DIAGRAM 6.—Gross tonnage of all vessels, by divisions: 1906 and 1889.



The large tonnage shown for the average vessel on the Mississippi river is due to the inclusion of the unriggered craft. The waters in which the unriggered craft are to operate and the class of freight to be carried necessarily control their size and to some extent the material to be used in their construction. Of the 4,265,740 gross tonnage reported for these craft operating on the Mississippi river and its tributaries, only 17,401, or less than 1 per cent, were iron and steel. In many instances the tonnage reported for these craft was not the result of actual measurement, but was an estimate. Considering all craft of this group, the largest average tonnage is shown for the Mississippi river and the largest average value for the Great Lakes. Large numbers of the barges on the Mississippi river and its tributaries are used to carry coal down the stream and are constructed so as to have the maximum tonnage, but with no intention of use on rough water, such as must be encountered by craft on the Great Lakes and other waters.

The aggregate tonnage for all vessels or the average tonnage per vessel conveys only an indefinite idea of the actual number of the large and small vessels. The relative importance of craft of different sizes can be ascertained only by arranging them in groups according to their gross tonnage; this has been done in Table 31.

Considering the total for all classes of craft reported at the census of 1906, it appears that the largest number, 10,886, is included in the group of from 5 to 49 gross tons. The largest total gross tonnage, 4,132,702, is shown for the group of from 1,000 to 2,499 tons, which includes only 3,350 vessels, the average tonnage being 1,234. The 124 vessels of 5,000 tons or over, representing the largest vessels reported, had a total tonnage of 865,385 and an average tonnage of 6,979.

While 65 per cent of the steam vessels are comparatively small craft of less than 100 gross tons, such craft represent only 4.8 per cent of the total steam tonnage; the large steam vessels, those of 1,000 tons or more, on the other hand, form only 10.3 per cent of the number, but represent 75.4 per cent of the total tonnage. There were 120 steam vessels of 5,000 or more tons each, the average tonnage of which was 7,042.

Among the sail vessels, craft of less than 100 gross tons constituted 69.3 per cent of the entire number, but represented only 7.1 per cent of the gross tonnage; while the large sail vessels of 1,000 tons or over, although constituting but 6.3 per cent of the number, represented 45.9 per cent, or nearly one-half of the tonnage.

The table is also significant in that it shows the importance of the unriggered craft of large tonnage. Of the 20,263 craft of this class, 26.4 per cent were of more than 500 tons, but the tonnage formed 62.3 per cent of the total tonnage for the class.

With the exception of 49 vessels on the Pacific coast all the vessels of 2,500 tons or over were reported from the Atlantic coast and Gulf of Mexico and from the Great Lakes district. The largest number of such vessels reported was among the steam vessels on the Great Lakes, and the next largest among the sail vessels on the same waters, the large vessels of the latter class being represented principally by the schooner barges. No vessels of this size were reported on the Mississippi river, but there were 4,332 vessels, with a tonnage of from 500 to 2,499, constituting 45 per cent of the total number reported in this district. Of these 4,332 vessels, however, only 63 were steam, the remainder being comprised principally of the numerous coal barges which figure so prominently in the traffic of that division.

Of the vessels on the Atlantic coast, 9,542, or 47.6 per cent, were of less than 100 tons; on the Pacific coast, 1,296 vessels, or 51.1 per cent; on the Great Lakes, 1,263, or 42.2 per cent; on the Mississippi river, 2,065, or 21.5 per cent; on the canals and other inland waters of New York state, 298, or 17.8 per cent; and on all other inland waters, 228, or 49 per cent. Excluding these small vessels there are altogether on the Atlantic coast 10,490 vessels, averaging 435 tons; on the Pacific coast, 1,241 vessels, with an average tonnage of 754; on the Great Lakes, 1,727 vessels, with an average tonnage of 1,358; and on the Mississippi river, 7,557 vessels, with an average tonnage of 573.

TABLE 31.—VESSELS GROUPED ACCORDING TO GROSS TONNAGE, BY DIVISIONS: 1906.

DIVISION AND CLASS.	TOTAL.		5 TO 49 TONS.		50 TO 99 TONS.		100 TO 199 TONS.		200 TO 299 TONS.		300 TO 399 TONS.	
	Number of vessels.	Gross tonnage.	Number of vessels.	Gross tonnage.	Number of vessels.	Gross tonnage.	Number of vessels.	Gross tonnage.	Number of vessels.	Gross tonnage.	Number of vessels.	Gross tonnage.
United States.....	37,321	12,893,429	10,886	207,660	3,806	272,358	7,712	1,094,373	3,452	840,078	1,843	631,247
Steam.....	9,927	4,059,521	5,068	92,344	1,386	101,886	1,034	147,917	418	102,032	257	89,640
Sail.....	7,131	1,704,277	4,255	72,734	685	47,731	353	51,219	242	60,491	205	71,241
Unrigged.....	20,263	7,129,631	1,563	42,582	1,735	122,741	6,325	895,237	2,792	677,555	1,381	470,366
Atlantic coast and Gulf of Mexico.....	20,032	4,851,421	7,413	133,812	2,129	151,754	3,839	549,840	2,127	513,836	1,429	486,094
Steam.....	5,413	1,457,894	3,019	55,988	763	55,734	500	83,092	225	54,840	107	37,370
Sail.....	5,920	1,132,905	3,792	63,191	592	40,928	299	42,889	169	41,971	137	47,615
Unrigged.....	8,699	2,260,622	602	14,633	774	55,092	2,950	423,859	1,733	417,025	1,185	401,109
Pacific coast (including Alaska).....	2,537	977,687	976	18,809	320	22,546	283	40,050	155	37,591	118	40,612
Steam.....	1,066	518,107	459	7,400	104	7,862	116	17,459	62	15,121	60	20,512
Sail.....	666	305,283	257	6,151	52	3,751	18	2,662	24	6,298	30	10,429
Unrigged.....	805	154,297	260	5,258	164	10,933	149	19,929	69	16,172	28	9,671
Great Lakes and St. Lawrence river.....	2,990	2,392,863	843	18,096	420	28,899	307	44,130	199	49,117	159	58,549
Steam.....	1,676	1,915,786	578	12,569	213	15,319	86	12,787	49	11,792	49	17,198
Sail.....	531	265,571	196	3,266	39	2,869	34	5,459	49	12,222	38	13,197
Unrigged.....	783	211,506	69	2,261	168	10,711	187	25,884	101	25,103	72	28,154
Mississippi river and its tributaries.....	9,622	4,411,967	1,383	31,759	682	48,654	1,912	295,536	784	196,099	105	34,990
Steam.....	1,435	146,227	788	12,346	265	19,991	183	26,898	76	18,839	39	13,893
Unrigged.....	8,187	4,265,740	595	19,413	417	28,663	1,729	268,638	708	177,260	66	21,097
Canals and other inland waters of New York state.....	1,675	218,527	105	1,990	193	16,244	1,153	136,313	174	40,676	28	9,675
Steam.....	151	14,127	80	1,523	17	1,145	45	5,924	4	1,006	1	300
Sail.....	13	495	9	103	2	183	2	209	.....	.....	.....	.....
Unrigged.....	1,511	203,905	16	364	174	14,916	1,106	130,180	170	39,670	27	9,375
All other inland waters.....	465	40,964	166	3,194	62	4,261	218	28,504	13	2,759	4	1,327
Steam.....	186	7,380	144	2,518	24	1,835	14	1,757	2	434	1	367
Sail.....	1	23	1	23	.....	.....	.....	.....	.....	.....	.....	.....
Unrigged.....	278	33,561	21	653	38	2,426	204	26,747	11	2,325	3	960

DIVISION AND CLASS.	400 TO 499 TONS.		500 TO 999 TONS.		1,000 TO 2,499 TONS.		2,500 TO 4,999 TONS.		5,000 TONS AND OVER.	
	Number of vessels.	Gross tonnage.	Number of vessels.	Gross tonnage.	Number of vessels.	Gross tonnage.	Number of vessels.	Gross tonnage.	Number of vessels.	Gross tonnage.
United States.....	1,552	677,488	4,175	2,654,477	3,350	4,132,702	421	1,517,661	124	865,385
Steam.....	215	96,145	527	366,661	548	924,492	354	1,293,364	120	845,040
Sail.....	224	100,797	718	517,208	388	581,046	57	181,465	4	20,345
Unrigged.....	1,113	480,546	2,930	1,770,608	2,414	2,627,164	10	42,832	.....	.....
Atlantic coast and Gulf of Mexico.....	869	380,276	1,441	997,370	585	852,007	169	556,311	31	230,121
Steam.....	115	51,113	249	176,096	184	289,359	131	429,399	30	224,908
Sail.....	155	69,299	485	356,998	262	380,716	28	84,080	1	5,218
Unrigged.....	599	259,864	707	464,276	139	181,932	10	42,832	.....	.....
Pacific coast (including Alaska).....	98	44,079	361	243,497	177	271,166	34	109,680	15	149,657
Steam.....	50	22,324	105	71,257	62	99,677	33	106,838	15	149,657
Sail.....	30	13,804	156	108,095	98	151,251	1	2,842	.....	.....
Unrigged.....	18	7,951	100	64,145	17	20,238	.....	.....	.....	.....
Great Lakes and St. Lawrence river.....	148	66,770	279	193,546	339	596,479	218	851,670	78	485,607
Steam.....	28	12,757	115	82,850	293	522,907	190	757,127	75	470,480
Sail.....	39	17,694	77	52,115	28	49,079	28	94,543	3	15,127
Unrigged.....	81	36,319	87	58,581	18	24,493	.....	.....	.....	.....
Mississippi river and its tributaries.....	424	181,044	2,087	1,215,430	2,245	2,408,455	.....	.....	.....	.....
Steam.....	21	9,482	56	34,824	7	9,954	.....	.....	.....	.....
Unrigged.....	403	171,562	2,031	1,180,606	2,238	2,398,501	.....	.....	.....	.....
Canals and other inland waters of New York state.....	11	4,400	7	4,634	4	4,595	.....	.....	.....	.....
Steam.....	.....	.....	2	1,634	2	2,595	.....	.....	.....	.....
Sail.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Unrigged.....	11	4,400	5	3,000	2	2,000	.....	.....	.....	.....
All other inland waters.....	2	919	.....	.....	.....	.....	.....	.....	.....	.....
Steam.....	1	469	.....	.....	.....	.....	.....	.....	.....	.....
Sail.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Unrigged.....	1	450	.....	.....	.....	.....	.....	.....	.....	.....

## VALUATION OF VESSELS.

The census of transportation by water in 1880 embraced only steam vessels, and their valuation was

secured through the United States local inspectors wherever the services of these officials were available. The estimated valuation was based upon the condition and age of the hull and boilers and the capacity of the



engines. Where there was no inspection the valuation was obtained from the owners or experts. The figures, however, are so meager that they have not been used in comparison with those of the later censuses.

In 1889 and 1906, the two years for which a regular census of transportation by water was taken, the commercial valuation of vessels was asked for, but in order to comprehend the comparative value of the data it is necessary to understand the varying conditions under which the figures were secured.

The report on water transportation for 1889 states that the valuation was high or low according to the basis upon which the information was given. In some instances the value was reported as the vessel's cost; in other cases the basis was what would be realized by sale; and in still others the valuation was given with the belief that the figures might be used as a basis for taxation. The report for 1889 also contains a comparative table from data collected by the Commissioner of Navigation showing for the years 1886 to 1890, inclusive, the insurance valuation of vessels on the Great Lakes. The information contained in this table was taken from Lloyd's Inland Register. It is doubtful if the variations in reporting the valuation of vessels in 1889 were wholly eliminated at the census of 1906. In fact the commercial valuation of a vessel or a fleet is capable of such an honest difference in the understanding of its meaning as might make comparative figures of valuation of vessels for the two censuses unreliable. If, for instance, commercial valuation is based upon the earning capacity of a vessel

or fleet, the value might be subject to great fluctuations from year to year and would largely represent the business success of the enterprise. It seems manifestly unfair to report the commercial valuation as the cost of the vessels, since this fails to give proper consideration to the important elements of age and condition. The amount that would be realized by sale is also an unreliable and unfair basis and resolves itself into the question of supply and demand at the time the inquiry is made. An insurance valuation, the basis of a premium required by the underwriters, might in consequence be excessive. It may safely be assumed that the valuation given by owners, who thought the information might be made the basis of taxation, would be low, but it is not believed there are many who now take such a false and narrow view of the use of Government statistics.

A correct commercial valuation seems difficult to define positively, so as to eliminate all the objections here referred to, but no fair basis seems possible without giving due weight to the age and condition of the vessel as a whole, including boilers and engines, if a steamer, and spars and sails, etc., if a sail vessel, together with proper consideration of the cost and earning capacity. Such a basis was attempted at the census of 1906, but the success of the effort is uncertain. It appears impossible also to determine the extent of the variation in reporting the valuation of vessels at the two censuses. The tables and analysis which follow in illustration of this subject are submitted, therefore, with this understanding.

TABLE 32.—NUMBER, TONNAGE, AND VALUE OF VESSELS, BY CHARACTER OF CONSTRUCTION: 1906 AND 1889.

CLASS.	Census.	TOTAL.			IRON AND STEEL.			WOOD.			COMPOSITE.		
		Number of vessels.	Gross tonnage.	Value of vessels.	Number of vessels.	Gross tonnage.	Value of vessels.	Number of vessels.	Gross tonnage.	Value of vessels.	Number of vessels.	Gross tonnage.	Value of vessels.
Aggregate.....	1906	37,321	12,893,429	\$507,973,121	1,979	3,276,723	\$306,229,289	35,247	9,581,348	\$199,135,582	95	35,358	\$2,608,250
	1889	30,485	8,359,135	206,992,352	548	525,218	50,918,319	29,834	7,793,259	153,552,913	103	40,658	2,521,120
Steam.....	1906	9,927	4,059,521	386,772,727	1,674	2,916,517	289,689,438	8,197	1,119,459	95,026,589	56	23,545	2,056,700
	1889	5,603	1,710,073	131,567,427	534	515,003	50,153,519	5,033	1,173,860	79,538,108	36	21,210	1,875,800
Freight and passenger...	1906	3,615	3,411,588	286,218,089	908	2,623,551	238,475,331	2,690	768,857	46,634,758	17	19,180	1,108,000
	1889	2,429	1,290,552	90,999,834	296	413,411	38,802,099	2,111	856,979	50,589,735	22	20,162	1,608,000
Tugs and other towing vessels.	1906	3,079	261,375	39,062,249	420	83,902	14,574,417	2,649	176,513	24,383,332	10	960	104,500
	1889	1,950	146,447	17,364,413	107	9,157	1,761,800	1,837	137,054	15,580,813	6	236	21,800
Ferryboats.....	1906	536	261,073	29,578,380	156	151,406	19,839,598	379	109,253	9,715,782	1	414	23,000
	1889	456	146,104	10,442,750	60	40,925	3,976,500	396	105,179	6,466,250			
Yachts.....	1906	2,176	82,275	24,281,861	134	38,294	12,524,020	2,016	41,643	11,036,641	26	2,338	721,200
	1889	230	13,586	3,858,810	25	4,864	1,649,720	202	8,369	2,074,090	3	353	135,000
All other.....	1906	521	43,210	7,632,148	56	19,364	4,276,072	463	23,193	3,256,076	2	653	100,000
	1889	538	113,384	8,901,620	46	46,646	3,963,400	487	66,279	4,827,220	5	459	111,000
Sail.....	1906	7,131	1,704,277	56,206,145	131	227,959	10,598,751	6,973	1,470,656	45,165,894	27	5,662	441,500
	1889	7,945	1,675,706	53,192,972	14	10,215	764,800	7,864	1,646,043	51,782,852	67	19,448	645,320
Freight and passenger...	1906	5,181	1,672,862	51,415,756	110	225,613	9,832,451	5,069	1,442,556	41,347,305	2	4,693	236,000
	1889	6,863	1,641,846	49,165,617	8	9,734	554,500	6,795	1,612,875	47,996,047	60	19,237	615,070
Yachts.....	1906	1,594	24,155	4,169,253	21	2,346	766,300	1,549	20,954	3,202,453	24	855	200,500
	1889	653	15,040	2,750,755	6	481	210,300	644	14,487	2,519,955	3	72	20,500
All other.....	1906	356	7,260	621,136				355	7,146	616,136	1	114	5,000
	1889	429	18,820	1,276,600				425	18,681	1,266,850	4	139	9,750
Unrigged.....	1906	20,263	7,129,631	64,994,249	174	132,247	5,941,100	20,077	6,991,233	58,943,099	12	6,151	110,050
	1889	16,937	4,973,356	22,231,953				16,937	4,973,356	22,231,953			

<sup>1</sup> Includes a few craft of metal construction which were not segregated in 1889.

During the period covered by the table the total valuation of all kinds of vessels increased \$300,980,769, or 145.4 per cent. Of the three general classes of vessels, the increase in the actual valuation of steamers was the largest, \$255,205,300, or 194 per cent, representing 84.8 per cent of the total increase for all kinds of vessels. The value of sailing vessels increased \$3,013,173, or 5.7 per cent, and that of unrigged craft \$42,762,296, or 192.3 per cent.

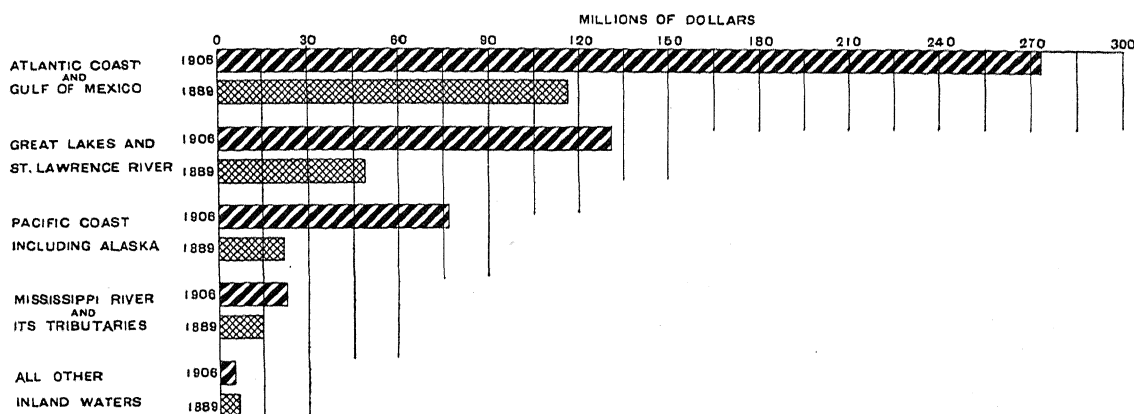
Of steam craft, under which are also included any vessels propelled by gasoline engines, electric power, etc., those classed as freight and passenger were by far the most important, their valuation constituting 74 per cent of the total for all kinds of steam vessels in 1906 and 69.2 per cent in 1889, while in the former year it represented 56.3 per cent and in the latter year 44 per cent of the total valuation for all vessels—steam, sail, and unrigged. The actual increase in the valuation of the freight and passenger vessels was \$195,218,255, and the average value per vessel increased \$41,711, or 111.3 per cent. This large increase was due entirely to the gain in the number of iron and steel vessels, as there was a decrease in the value of vessels of wood or of composite construction. In addition to the fact that metal construction costs more per ton than wood, there has been since 1889 a great advance among the merchant navies of the world, not only in the size of the vessels, in which American freight and passenger steam vessels showed an average increase of 413 tons, or 77.8 per cent, but

also in furnishings and speed. This latter element constitutes a very important factor in the cost of the modern steamship, but neither the census of 1889 nor that of 1906 made any report in reference to this feature of construction. Lloyd's Register of American Shipping, however, contains the name of but one vessel of American ownership built prior to 1889 having a sustained speed of over 16 knots—a small 17-knot steamer of 1,440 gross tons—whereas since that date, including those built during 1906, there have been added to the American merchant marine 38 vessels having a sustained speed of from 16½ to 20 knots and representing a total of 172,404 gross tons.<sup>1</sup>

Tugboats increased \$21,697,836 in value, or 125 per cent, those of metal construction showing the largest gain. The average size of tugs varied but little at the two censuses. The value of ferryboats increased \$19,135,630, or 183.2 per cent, the increase being principally for those of metal construction. Although the average size of vessels of this class has increased since the census of 1889, it has not been sufficient to account for the gain in valuation, which no doubt represents the replacing of old and worn-out vessels by those of more expensive type, as well as the addition of many new boats of a more modern and costly construction. In fact the conditions governing the demand for better vessels among passenger and freight craft apply equally to ferryboats, which may be said to be their coadjutors.

<sup>1</sup> Lloyd's Register of American Shipping, 1907-8.

DIAGRAM 7.—VALUE OF ALL VESSELS, BY DIVISIONS: 1906 AND 1889.



Yachts, both steam and sailing, may be treated together, since they are apart from the commercial or the earning tonnage of the country but represent the demands and taste of individual owners. Of these vessels, the valuation of steam yachts showed an increase of \$20,423,051, or 529.2 per cent, against an increase of but \$1,418,498, or 51.6 per cent, for those relying on sails for propulsion. The great gain in steam

yachts is further illustrated by a comparison of the gain in tonnage, those using steam showing an increase of 68,689 tons, or 505.6 per cent, compared with a gain of 9,115 tons, or only 60.6 per cent, for those dependent upon sails. Both kinds of yachts show marked increases for composite construction, tugboats being the only other class of vessels to show any definite gain in this respect.



"All other" craft embraces the great variety of vessels not covered by the specific classes referred to, such as the numerous boats used for taking out pleasure parties, dredges, pile drivers, police boats, pilot boats, vessels used for scientific purposes, etc. The value of steam vessels of this class decreased \$1,269,472, or 14.3 per cent, and sailing vessels showed a decrease of \$655,464, or 51.3 per cent. The steam vessels included under this classification decreased in number 17, or 3.2 per cent, and 70,174, or 61.9 per cent, in tonnage; these losses, while seemingly inconsistent with the gain in other classes of steam vessels, are due probably to the difference in the character of the vessels included under this classification at the two censuses.

There was an increase of \$2,250,139, or 4.6 per cent, in the actual value of freight and passenger sailing vessels, and a gain of 31,016 tons, or 1.9 per cent, in tonnage, but a decrease of 1,682, or 24.5 per cent, in their number. There was a marked falling off, however, in the relative importance of this class of vessels, as in 1906 they represented but 10.1 per cent of the total valuation for all kinds of craft, against

23.8 per cent in 1889. These figures, when considered in connection with the increase shown for steam craft, indicate the extent to which the latter have superseded the sailing vessel.

The value of unrigged craft increased \$42,762,296, or 192.3 per cent, which is entirely out of proportion to the increase in number and tonnage, and indicates a greater value per vessel. The average value per vessel increased \$1,895, or 144.3 per cent. The census of 1906 included a large number of undocumented dredges of considerable cost, statistics for which were not secured at the census of 1889, and to this fact is due much of the gain shown in value. There has been also a considerable decrease in the number of canal boats and an increase in the number of large barges, resulting to a great extent from the decreasing use of the old-time sailing ships, many of which have been reduced to mere hulks of large capacity, dependent upon the towboat for propelling power.

The average value per vessel and per gross ton, shown in Table 33, for the different classes of craft as reported at the last two censuses, are of interest in connection with the figures in Table 32.

TABLE 33.—AVERAGE TONNAGE AND VALUE PER VESSEL AND AVERAGE VALUE PER TON: 1906 AND 1889.

CLASS.	Census.	TOTAL.			IRON AND STEEL.			WOOD.			COMPOSITE.		
		Average tonnage per vessel.	Average value per vessel.	Average value per ton.	Average tonnage per vessel.	Average value per vessel.	Average value per ton.	Average tonnage per vessel.	Average value per vessel.	Average value per ton.	Average tonnage per vessel.	Average value per vessel.	Average value per ton.
Aggregate.....	1906	345	\$13,611	\$39	1,656	\$154,739	\$93	272	\$5,650	\$21	372	\$27,455	\$74
	1889	274	6,790	25	958	92,917	97	261	5,147	20	395	24,477	62
Steam.....	1906	409	38,962	95	1,742	173,052	99	136	11,593	85	420	36,727	87
	1889	305	23,482	77	964	93,920	97	233	15,803	68	589	52,106	88
Freight and passenger.....	1906	944	79,175	84	2,889	262,638	91	286	17,336	61	1,128	65,176	58
	1889	531	37,464	70	1,397	131,088	94	406	23,965	59	916	73,091	80
Tugs and other towing vessels	1906	85	12,687	149	200	34,701	174	67	9,205	138	96	10,450	109
	1889	75	8,905	118	86	16,465	192	75	8,482	114	39	3,633	92
Ferryboats.....	1906	487	55,184	113	970	127,177	131	288	25,635	89	414	23,000	56
	1889	320	22,901	71	682	66,275	97	266	16,329	61			
Yachts.....	1906	38	11,159	295	286	93,463	327	21	5,474	265	90	27,738	308
	1889	59	16,777	284	194	65,989	339	41	10,268	248	118	45,000	382
All other.....	1906	83	14,649	177	346	76,858	221	50	7,032	140	326	50,000	153
	1889	211	16,546	78	1,014	86,161	85	136	9,912	73	92	22,200	242
Sail.....	1906	239	7,882	33	1,740	80,906	46	211	6,477	31	210	16,352	78
	1889	211	6,695	32	730	54,628	75	209	6,585	31	290	9,632	33
Freight and passenger.....	1906	323	9,924	31	2,051	89,386	44	284	8,157	29	2,346	118,000	50
	1889	239	7,164	30	1,217	69,312	57	237	7,063	30	321	10,251	32
Yachts.....	1906	15	2,616	173	112	36,490	327	14	2,067	153	36	8,354	234
	1889	23	4,212	183	80	35,050	437	22	3,913	174	24	6,833	285
All other.....	1906	20	1,745	86				20	1,736	86	114	5,000	44
	1889	44	2,076	68				44	2,981	68	35	2,438	70
Unrigged.....	1906	352	3,208	9	760	34,144	45	348	2,936	8	512	9,171	18
	1889	294	1,313	4				294	1,313	4			

<sup>1</sup> Includes a few craft of metal construction which were not segregated in 1889.

#### VALUE OF LAND PROPERTY.

The \$507,973,121 reported as the commercial value of the vessels and craft covered by the census represents only a part of the capital devoted to the water transportation interests of the United States. The value of all land, wharves, warehouses and other buildings,

fixtures, machinery, implements, tools, cash on hand, and all property other than the vessels and their outfits, but incident to their operation, should be theoretically included in the capital for the industry. As a matter of fact, although most of the large shipping companies own their wharves, a large proportion of the

land property is not owned by the transportation companies, and these companies could give no information concerning its value. Much of it is owned by local governments, or by dock companies, railroads, individuals, corporations, and others, that do not own or operate craft of any kind. While the capital invested in such property is employed primarily in water transportation, it also represents other interests, such as railroad traffic, storage and mercantile transactions, and it would be difficult, and in many cases impracticable, to make a segregation which would show the amount that could be considered as devoted to water transportation. To obtain any information on the subject would necessitate a special canvass of interests not represented by the owners of water craft. As this would add greatly to the expense of the census and the results would be of doubtful value, the inquiry concerning land property was restricted to that owned by the shipping companies. But many companies are engaged in transportation by both land and water, and others operate vessels in connection with a mining or manufacturing business. In such cases it was impracticable to separate the value of the property devoted to water transportation, and no amounts were reported.

It is the practice of the shipping companies operating out of New York to lease their dock facilities from the city. The lease may require the lessee to erect, at his own expense, all houses that may be necessary, subject to the approval of the Department of Docks and Ferries, the entire property reverting to the city on the expiration of the lease. As a similar practice prevails to some extent in other cities, the Census schedule required the value of leases or annual rentals to be reported separately. The answer to this inquiry included the amount of the annual rent and a proportion of the cost of the buildings, etc., if erected at the expense of the lessee.

Under the foregoing conditions it was impossible to obtain satisfactory data for land property, therefore the statistics are defective, and are not included in the tables. The value of the land property reported in answer to this inquiry amounted, however, to \$80,912,947. This includes the value of the wharves and docks incident to the operation of the municipal ferries in New York and Boston, but does not include other wharves and docks owned by these or other cities. The leases and annual rentals were valued at \$7,642,259.

#### CHARACTER OF PROPULSION AND HORSEPOWER.

The period between the census of transportation by water for 1889 and that for 1906 witnessed a great advance in the marine engine. Probably the most notable achievement is the success of the turbine engine and its adaptation to vessels of the largest type. The gasoline engine has also developed during the period, not only because of the small space required for the equipment and on account of its cleanliness, but by reason of the low cost of installation, cheapness of gasoline, and small expense for employees to operate it. The use of oil as a fuel appears to be growing in favor, partly because of the decrease in the number of stokers, coal trimmers, etc., which the use of this fuel makes possible. The internal combustion engine is rapidly developing, and if the gas engine meets the expectations of its many advocates it will revolutionize power in the maritime world.

Although electricity was reported as a means of propulsion on but few small yachts, it has an extensive and growing use on shipboard as a subsidiary power. Some idea of the extent to which electricity is employed in the latter capacity can be obtained from the equipment of the new Cunard liner *Mauretania*, on which the generating plant is said to consist of four sets of turbo-generators, each capable of supplying 4,000 amperes at 110 volts when run at a speed of 1,200 revolutions per minute. The steampower required for this would drive a 10,000-ton cargo steamer at a speed of 10 knots.<sup>1</sup>

As the census of transportation by water for 1906 was the first at which the character and amount of horsepower was secured, it is impossible to present comparative figures which will show the actual growth of horsepower in the merchant marine. The gain, however, in steam tonnage from 1,710,073 tons in 1889 to 4,059,521 tons in 1906, an increase of 137.4 per cent, is significant of what might be expected in the growth of horsepower. The average horsepower per ton in 1906 was eighty-five one-hundredths of a horsepower. Assuming that this average per ton was the same in 1889, that census would have shown a total of 1,453,562 horsepower, which compared with the total for 1906 would give an increase of 1,998,183 horsepower.

<sup>1</sup>American Marine Engineer, January, 1908.

TABLE 34.—CHARACTER OF POWER AND PROPULSION, BY DIVISIONS: 1906.

DIVISION.	Number of ves-sels.	Total horse-power.	SCREW.								
			Steam.			Gasoline.			All other.		
			Number of ves-sels.	Gross tonnage.	Horsepower.	Number of ves-sels.	Gross tonnage.	Horse-power.	Number of ves-sels.	Gross tonnage.	Horse-power.
Total.....	9,927	3,451,745	5,160	3,424,972	2,717,649	2,785	46,159	67,152	7	92	88
Atlantic coast and Gulf of Mexico....	5,413	1,758,378	2,907	1,135,578	1,413,088	1,946	33,655	45,369	5	72	64
Pacific coast (including Alaska).....	1,066	445,717	507	408,849	357,503	330	6,251	10,372	.....	.....	.....
Great Lakes and St. Lawrence river....	1,676	982,555	1,396	1,862,244	912,947	219	3,122	5,687	1	5	8
Mississippi river and its tributaries....	1,435	236,969	130	6,652	18,326	226	2,182	4,098	.....	.....	.....
Canals and other inland waters of New York state.....	151	17,767	107	8,109	10,324	30	521	812	1	15	16
All other inland waters.....	186	10,359	113	3,540	5,461	34	428	814	.....	.....	.....

DIVISION	STERN WHEEL.						SIDE WHEEL.						ALL OTHER.		
	Steam.			Gasoline.			Steam.			Gasoline.			Steam.		
	Num-ber of ves-sels.	Gross tonnage.	Horse-power.	Num-ber of ves-sels.	Gross tonnage.	Horse-power.	Num-ber of ves-sels.	Gross tonnage.	Horse-power.	Num-ber of ves-sels.	Gross tonnage.	Horse-power.	Num-ber of ves-sels.	Gross tonnage.	Horse-power.
Total.....	1,055	193,208	247,020	351	4,592	5,747	543	389,327	413,152	19	247	305	7	924	632
Atlantic coast and Gulf of Mexico....	157	17,226	19,557	26	395	533	368	270,831	278,675	2	22	30	2	115	62
Pacific coast (including Alaska).....	184	67,364	54,271	7	175	208	34	35,394	23,246	4	74	117	.....	.....	.....
Great Lakes and St. Lawrence river....	6	859	880	2	24	13	51	49,339	62,985	.....	.....	.....	.....	.....	.....
Mississippi river and its tributaries....	678	104,476	169,210	312	3,929	4,911	72	28,221	39,731	13	151	158	4	616	535
Canals and other inland waters of New York state.....	5	562	265	.....	.....	.....	8	4,920	6,350	.....	.....	.....	.....	.....	.....
All other inland waters.....	25	2,721	2,837	4	69	82	10	622	1,165	.....	.....	.....	.....	.....	.....

TABLE 35.—Vessels propelled by steam, gasoline, and electricity, and per cent each is of total: 1906.

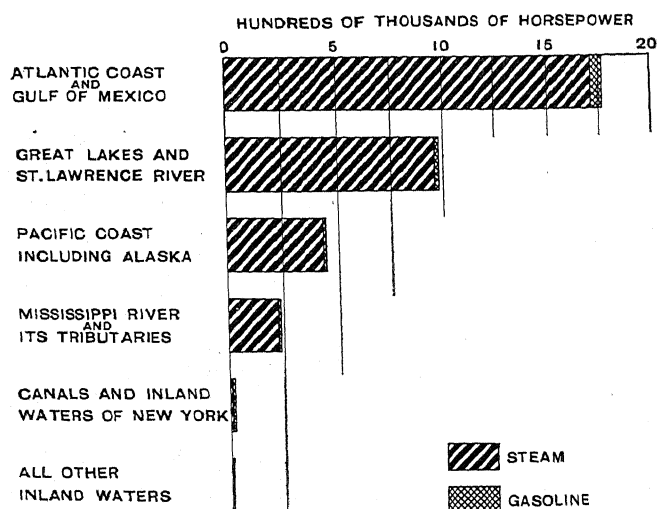
	Total.	Steam.	Gasoline.	Elec-tric.	PER CENT OF TOTAL.		
					Steam.	Gasoline.	Elec-tric.
Number of vessels..	9,927	6,765	3,155	7	68.1	31.8	0.1
Screw.....	7,952	5,160	2,785	7	64.9	35.0	( <sup>1</sup> )
Stern wheel.....	1,406	1,055	351	.....	75.0	25.0	.....
Side wheel.....	562	543	19	.....	96.6	3.4	.....
All other.....	7	7	.....	.....	100.0	.....	.....
Gross tonnage.....	4,059,521	4,008,431	50,998	92	98.7	1.2	( <sup>1</sup> )
Horsepower.....	3,451,745	3,378,453	73,204	88	97.9	2.1	( <sup>1</sup> )

<sup>1</sup> Less than one-tenth of 1 per cent.

Of the total horsepower reported in 1906, 3,378,453, or 97.9 per cent, was steam and 73,204, or 2.1 per cent, was from the use of gasoline. The 88 horsepower reported as "electric" is in the shape of storage batteries on 7 small yachts.

The Atlantic coast and Gulf of Mexico led in the amount of horsepower reported, with 50.9 per cent, or slightly more than half the total, while the other districts came in the following order: The Great Lakes and St. Lawrence river, with 28.5 per cent of the total; the Pacific coast, with 12.9 per cent; the Mississippi river and its tributaries, with 6.9 per cent; the canals and other inland waters of New York state, with five-tenths of 1 per cent; and all other inland waters, with three-tenths of 1 per cent.

DIAGRAM 8.—Horsepower of steam vessels: 1906.



In respect to the character of propulsion, 7,952, or 80.1 per cent, of the vessels were equipped with the screw propeller, which was first applied in England in 1837 and in the United States in 1841.<sup>1</sup> Vessels equipped with the stern wheel ranked second in number and had their greatest use on rivers, 70.4 per cent being located in the Mississippi river district alone. This type of craft represented 14.2 per cent of the total number of all classes of vessels using power. Next

<sup>1</sup> Tenth Census, Report on Shipbuilding Industry.

in order came those equipped with the side wheel, forming 5.7 per cent of the total number, which indicates the limited use of this kind of propulsion, the first to which steampower was applied.

There is a great disproportion between the number of vessels propelled by steam and by gasoline engines when compared with their tonnage and horsepower. Vessels reporting the use of steampower for propulsion numbered 6,765, or 68.1 per cent of the total, but their tonnage was 4,008,431, or 98.7 per cent of the total tonnage for all classes, and their horsepower 3,378,453, or 97.9 per cent of the total. Gasoline boats, on the other hand, were reported to the number of 3,155, or 31.8 per cent of the total number for all classes of vessels, but their tonnage was only 50,998, or 1.2 per cent of the total, and their horsepower 73,204, or 2.1 per cent of the total. While the use of gasoline is largely confined to small craft, there are some fairly large vessels equipped with engines of this class having a capacity of several hundred horsepower. The expense of operating gasoline engines of large power together with the element of danger have undoubtedly been strong factors in confining their use to small vessels. The fact should not be overlooked that the Census inquiry was confined to vessels of not less than 5 net tons, so that the hundreds of boats of smaller tonnage using the gasoline engine do not ap-

pear in this report. Of the total tonnage shown in these tables, 3,471,223 tons, or 85.5 per cent, was propelled by the screw propeller; 389,574 tons, or 9.6 per cent, by the side wheel; 197,800 tons, or 4.9 per cent, by the stern wheel; and 924 tons, or less than one-tenth of 1 per cent, by other methods. The horsepower reported for the several types was as follows: Screw propeller, 2,784,889 horsepower, or 80.7 per cent of the total; side wheel, 413,457 horsepower, or 12 per cent; stern wheel, 252,767 horsepower, or 7.3 per cent; and for all other types, 632 horsepower, or less than one-tenth of 1 per cent.

The freight and passenger vessels reported 65.9 per cent of the total horsepower; tugs and towing vessels, 18.7 per cent; ferryboats, 7.7 per cent; yachts, 5.8 per cent; and all other craft, 1.8 per cent. The figures for passenger and freight vessels show that 76.5 per cent were fitted with screw propellers, 15.6 per cent with stern wheels, while 7.9 per cent were side wheelers. Among tugs and towing vessels, 78.8 per cent used screw propellers, 20.3 per cent stern wheels, and nine-tenths of 1 per cent side wheels. Of the ferryboats, 35.1 per cent were equipped with screw propellers, 21.1 per cent with stern wheels, 42.5 per cent with side wheels, while the equipment of 7 was of miscellaneous character, representing 1.3 per cent of the total number.

TABLE 36.—CHARACTER OF PROPULSION AND HORSEPOWER OF STEAM VESSELS, BY OCCUPATION: 1906.

OCCUPATION.	CHARACTER OF PROPULSION.					HORSEPOWER OF ENGINES.			
	Total.	Screw (number).	Side wheel (number).	Stern wheel (number).	All other (number).	Total.	Steam.	Gasoline.	All other.
Total.....	9,927	7,952	562	1,406	7	3,451,745	3,378,453	73,204	88
Freight and passenger.....	3,615	2,766	285	564	.....	2,275,712	2,255,295	20,417	.....
Tugs and other towing vessels.....	3,079	2,428	27	624	.....	645,286	637,950	7,336	.....
Ferryboats.....	536	188	228	113	7	265,650	264,414	1,245	.....
Yachts.....	2,176	2,093	7	76	.....	201,983	162,032	39,871	80
All other.....	521	477	15	29	.....	63,105	58,762	4,335	8

#### INCOME.

The only financial statistics included in this census relate to the value of the vessels and land property, the salaries and wages paid, and the gross income derived from the operation of the vessels during the census year. With the exception of some of the craft owned by municipalities or other local governments and those used exclusively for pleasure, such as yachts, all the craft included in the census were operated for the purpose of producing revenue. A small amount of revenue was also reported for yachts, but it represents income from chartering or leasing and was only incident to the other objects for which the craft were used.

At the census of 1889 there was no separation of the gross earnings, and therefore no comparison can be made of the amounts for each of the three sources of income shown in Table 37 for 1906. The increase in the total income for the different classes of craft and

for all craft operating on the different waters of the country is shown in the comparative tables.

The income reported was the gross receipts for the entire census year. In cases where the owners were engaged in other business transactions entirely distinct from the operation of the vessels, such as the operation of railroads or mines, or manufacturing or mercantile pursuits, an estimate of the income derived from the vessels was given in reply to the Census inquiry. In some cases it was impossible to ascertain the exact amount of income from the different sources. Although the amount received for the passenger traffic was generally kept as a separate item in the account books of the shipping companies, in some instances, and especially for ferries, it was impracticable to obtain this amount as distinct from that received for the carriage of loaded vehicles or general express and freight matter, and in such cases estimates were

accepted. It was also impossible to obtain the income from craft operated as connecting links in railway systems. There are instances of duplication in the combination of the amounts reported as income from freight and as income from towing. Such duplication arises when the two classes of craft were operated under different ownership, the income from freight, which necessarily included the towing charge, being reported by the owner of the barges, and the income for towing by the owner of the tugboat. With these exceptions, the \$294,854,532 given in Table 37 may be accepted as the gross earnings of all American craft during the year 1906; the totals for the three items "freight," "passenger," and "all other"

do not, with the same degree of exactness, represent the income from each of these sources. They do, however, indicate that approximately 59.5 per cent of the gross income was derived from freight, 14.8 per cent from passengers, and 25.7 per cent from lightering, towing, chartering, etc. The proportion of the income that was derived from freight was largest on the Great Lakes and the St. Lawrence river and smallest for the vessels operating on the Mississippi river and its tributaries. The proportion derived from the passenger service was largest for the vessels on the Pacific coast and smallest for those on the Great Lakes and the St. Lawrence river.

TABLE 37.—GROSS INCOME—ALL VESSELS AND CRAFT, BY DIVISIONS AND OCCUPATIONS: 1906.

DIVISION AND OCCUPATION.	Total.	Freight.	Passenger.	All other.
Total.....	\$294,854,532	\$175,545,361	\$43,645,365	\$75,663,806
Freight and passenger.....	193,565,044	151,823,094	33,147,901	8,594,049
Towing vessels and unrigged craft.....	80,562,881	23,673,211	80,423	56,809,247
All other.....	20,726,607	49,056	10,417,041	10,260,510
Atlantic coast and Gulf of Mexico.....	159,759,924	83,890,161	25,643,332	50,226,431
Freight and passenger.....	92,096,988	68,185,461	18,208,365	5,703,162
Towing vessels and unrigged craft.....	54,727,996	15,097,425	46,254	38,984,317
All other.....	12,934,940	7,275	7,388,713	5,538,952
Pacific coast (including Alaska).....	48,520,139	29,340,102	10,424,493	8,755,544
Freight and passenger.....	37,909,854	28,155,569	8,375,705	1,438,580
Towing vessels and unrigged craft.....	6,238,856	1,184,118	10,208	5,044,539
All other.....	4,311,429	415	2,038,880	2,272,434
Great Lakes and St. Lawrence river.....	65,274,702	52,076,533	4,866,904	8,331,265
Freight and passenger.....	56,850,553	51,150,376	4,408,880	1,291,297
Towing vessels and unrigged craft.....	7,067,422	889,511	1,168	6,176,743
All other.....	1,356,727	36,646	456,856	863,225
Mississippi river and its tributaries.....	17,342,038	7,450,869	2,281,243	7,609,926
Freight and passenger.....	5,934,629	4,038,002	1,766,581	130,046
Towing vessels and unrigged craft.....	9,342,145	3,412,867	15,780	5,913,498
All other.....	2,065,264	.....	498,882	1,566,382
Canals and other inland waters of New York state.....	2,816,604	2,233,920	264,397	318,287
Freight and passenger.....	387,489	108,648	259,037	19,804
Towing vessels and unrigged craft.....	2,423,965	2,125,272	1,350	297,343
All other.....	5,150	.....	4,010	1,140
All other inland waters.....	1,141,125	553,776	164,996	422,353
Freight and passenger.....	325,531	185,038	129,333	11,160
Towing vessels and unrigged craft.....	762,497	364,018	5,663	392,816
All other.....	53,097	4,720	30,000	18,377

The number, tonnage, and value of the vessels indicate the magnitude of the shipping interests, but the extent of their operations can only be determined by statistics of earnings, persons employed, and freight and passengers carried. Of these factors, it is believed that the totals for earnings, employees, and wages are the most complete. The increase in the gross income and the relation it bears to the tonnage and passengers carried is of course controlled to some extent by changes in freight and passenger rates. As shown in Table 1, the gross tonnage of the active vessels during 1906 showed an increase of 54.2 per cent over the tonnage for 1889, while the income increased 82 per cent. But on the other hand, the estimated commercial value of the craft increased 145.4 per cent, while in 1889 there was \$78 of gross income for every \$100 of value as compared with a gross income of \$58

for every \$100 of value in 1906. But as the value placed on the vessels and craft for Census purposes was not estimated with the care and consideration that should be given for values on which computations of this character are based, these percentages should be accepted only as an indication, and not as a true reflection of actual conditions. It is also probable that the totals for 1906 include the value of a larger number of yachts and of craft operated by railroads and others for which no income was returned than was reported at the census of 1889. If the figures for yachts and boats owned by local governments and those operated as connecting links in railway systems are excluded from the totals for 1906, there remain 31,772 vessels with a gross tonnage of 12,148,664 and valued at \$450,521,010, or \$37 per ton and \$14,180 per vessel. The gross income from these

vessels for the year was \$278,935,323, or \$62 for each \$100 of value. This tonnage, value, and income is almost wholly connected with the freight and passenger traffic, but it does not represent all the vessels and craft so employed, and because of the inherent defects existing in Census work of this character, the

statistics for them should not be accepted as showing actual conditions.

#### EMPLOYEES AND WAGES.

The following inquiry and the accompanying instructions were used to collect the statistics for this feature of the census:

**Employees:** Account for the entire force employed on vessels or incident to their operation. The average number is the number required to operate the vessel. For employees on land give the average number employed during the entire year. If longshoremen or other persons are employed for short intervals, a careful computation should be made of the average number employed during the entire year, so as to avoid a duplication of the number when the reports for all craft, irrespective of ownership, are combined in the tabulations of the census. Give the total amount paid in wages and salaries during the year to all employees of each group. Wages should include board and lodging furnished as part compensation.

	AVERAGE NUMBER.	TOTAL AMOUNT PAID IN SALARIES OR WAGES DURING THE YEAR.
Employed on vessels or craft .....		\$ .....
EMPLOYED ON LAND, BUT INCIDENT TO THE OPERATION OF THE VESSELS OR CRAFT:		
Officers, managers, clerks, and all other salaried employees .....		\$ .....
All other employees .....		\$ .....
TOTAL .....		\$ .....

The number of persons reported as employed on vessels or craft was the number ordinarily required for their operation, including officers of all grades, seamen, stewards, cooks, laborers, etc. No distinction was made between the officers and the crew, because the managing owners contended that it was impracticable to separate the wages and salaries for the different classes. As it was the endeavor in all instances, where board was furnished the crew, to include, in the total wages, the amount of the food bill for the year, the

wages should not be accepted as representing cash payments.

The land force reported included only the persons employed in connection with the operation of the vessels, in their loading and unloading, in the care and shipment of freight, in working about the warehouses, etc. The officers referred to in the inquiry are the general officers of corporations and do not include officers employed on the vessels.

TABLE 38.—EMPLOYEES, AND SALARIES AND WAGES, BY DIVISIONS: 1906.

DIVISION.	TOTAL.		ON VESSELS.		ON LAND.					
					Total.		Officers, managers, clerks, etc.		All other.	
	Number of employees.	Salaries and wages.	Number of employees.	Wages.	Average number of employees.	Salaries and wages.	Average number of employees.	Salaries.	Average number of employees.	Wages.
Total .....	188,348	\$103,062,712	140,929	\$71,636,521	47,419	\$31,456,191	13,464	\$12,276,420	33,955	\$19,179,771
Atlantic coast and Gulf of Mexico .....	109,985	59,125,132	77,124	38,352,259	32,861	20,772,873	8,500	7,865,181	24,361	12,907,692
Pacific coast (including Alaska) .....	25,519	17,190,022	20,142	12,950,399	5,377	4,239,623	1,853	1,768,849	7,524	2,470,774
Great Lakes and St. Lawrence river .....	31,253	18,170,296	24,916	13,280,716	6,337	4,889,580	1,974	1,874,357	4,363	3,015,223
Mississippi river and its tributaries .....	17,473	7,063,776	15,016	5,692,117	2,457	1,371,659	1,011	686,536	1,446	685,123
Canals and other inland waters of New York state .....	2,741	1,033,365	2,499	929,710	242	103,655	92	54,695	150	48,960
All other inland waters .....	1,377	510,121	1,232	431,320	145	78,801	34	26,802	111	51,999

If a company was engaged exclusively in the shipping industry, and had a regular land force incident to the operation of vessels, this land force was reported in answer to the Census inquiry concerning the number employed on land; but in many instances the difficulties attending the collection of statistics concern-

ing the number and wages of persons thus employed were somewhat similar to those referred to in connection with the valuation of land property. Such employees frequently work for master stevedores who load and unload vessels by contract. Where this practice prevailed or the stevedores were employed at



odd intervals, it was necessary to estimate the average number employed during the year and report as wages the amount paid for loading and unloading. As a rule, it is the large shipping companies which have the freight handled exclusively by their regular employees and the smaller operators who employ the contract stevedores. The shipments of many large vessels are, however, handled through arrangements with companies that make a specialty of loading and unloading freight.

The roustabouts and laborers employed in connection with craft operating on the Mississippi river and its tributaries are generally carried on the boat and included in the census as a part of the crew. Coal barges operating on these rivers are frequently loaded by the regular employees of the coal companies, and the delivery of the cargo does not include the unloading, which, as a rule, is done by the consignee. When this was the case the number of laborers was not included in the census. Machinery, however, is used extensively, especially in the shipment of ore, coal, and grain, and the number of persons employed on land in connection with vessels devoted to the carriage of such commodities is comparatively small. In some cases the regular employees of the shipping companies were engaged partly in branches of work not directly connected with the shipping, making it difficult to estimate the number that should be considered as employed exclusively in connection with water transportation.

There is thus little uniformity in the method of handling freight, and while the census includes practically all the land force, the statistics are not as complete as those for the persons employed on the vessels, and are presented, therefore, only in Table 38.

The number of persons employed on land was not reported at the census of 1889, but the number and wages of those reported as employed on the vessels at that census are given in the comparative tables. The inquiry at the census of 1889 called for the "number making up ordinary crew of vessel," and "total wages paid during the year," but there were no definite instructions in regard to the inclusion of board furnished as part compensation, and therefore a comparison of the aggregate wages in 1889 with the aggregate for 1906, which is supposed to include an allowance for board, indicates an increase that may be somewhat in excess of the actual increase.

The number of persons employed on vessels in 1906, when compared with the number so employed in 1889, shows an increase of 27,059. The number on steam vessels, including unrigged craft, increased by 45,178, while the number on sail vessels decreased by 18,119. The greatest number and the largest increase in employees is shown for vessels operating on the Atlantic coast and the Gulf of Mexico. The number for vessels in these waters increased 13,499, or 21.2 per cent, and formed 55.9 per cent of the total for all vessels in 1889

and 54.7 per cent of the total for 1906. The next greatest number, 24,916, was employed on the Great Lakes and the next, 20,142, on the Pacific coast.

There were 140,929 persons employed on vessels at the census of 1906, being an average of 3.8 for each vessel. This includes all classes of craft, on many of which none were employed. For the regular passenger and freight steamers the average for 1906 was 17.1 per vessel. The average for all vessels of this class can not be obtained for 1889, but the average for such vessels operating on the Atlantic coast and the Gulf of Mexico was 19.5 and for those on the Pacific coast 16.4 as compared with 16.5 and 19.8 in 1906.

The wages reported are the total amount paid during the year, but there is no indication of the term of employment. A vessel requires as large a crew for a cruise of one or two months as it does for one of a year, but the combination of the amounts paid for various periods of employment should not be used as a basis to compute the annual wages. The statistics include wages paid employees on dredges, pile drivers, and similar craft, many of which are operated by harbor commissioners or other Government officials. The wages on these craft are, in many instances, much higher than on other vessels. The statistics, being compiled uniformly for all classes of vessels, can be used to show the contribution of each class to the aggregate for the United States. Of the \$103,092,712 reported for salaries and wages, \$71,636,521, or 69.5 per cent, were for employees on vessels and \$31,456,191, or 30.5 per cent, for those on land. Of the total for employees on vessels, \$50,504,508, or 70.5 per cent, went to those on steam vessels; \$10,371,047, or 14.5 per cent, to those on sail vessels; and \$10,760,966, or 15 per cent, to those on unrigged craft. Unrigged craft are sometimes operated by the crew of the steamboat and in such cases the wages are credited to the steam vessels. The \$59,125,132 reported as salaries and wages on the Atlantic coast and the Gulf of Mexico forms 57.4 per cent of the total. The next largest amount, \$18,170,296, or 17.6 per cent, is reported for the Great Lakes. The Pacific coast ranks third in this respect, the total being \$17,190,022, or 16.7 per cent.

The census contains no information in regard to the number of the different classes of seamen or to the rates of wages paid, because such information is contained in the annual reports of the Bureau of Navigation, Department of Commerce and Labor. The statistics which are compiled by the United States shipping commissioners show the average rates of wages paid to seamen of the various grades on steam and sailing vessels in the different branches of the foreign and coasting trade. These figures indicate a wide range of wages in the American merchant marine, as is shown by the following tabular statement prepared from that source, which presents data for the year ending June 30, 1906. It should be explained that the statement does not include the wages paid on

the Great Lakes but only on the Atlantic coast and Gulf of Mexico and the Pacific coast, and that the extreme rates given must not be accepted as the lowest and highest wages paid in individual cases; they are simply port averages. The rates represent the cash earnings of the crew and do not include board furnished as part compensation.

*Range of rates of monthly wages.*

GRADE.	On steam vessels.	On sail vessels.
Able seamen.....	\$15 to \$45.42	\$15 to \$40
Boatswains.....	25 to 50	20 to 50
Carpenters.....	30 to 60	25 to 53.57
First mates.....	40 to 125	25 to 61.50
Second mates.....	30 to 76.67	18 to 50.12
Firemen.....	16 to 50	.....
Trimmers.....	14 to 40.53	.....
First engineers.....	70 to 180	.....
Second engineers.....	50 to 126.50	.....

**FREIGHT.**

The annual reports and monthly summaries of commerce and finance published by the Bureau of Statistics contain information concerning the quantity of freight carried on the Great Lakes and other waters of the United States; the reports of the chief of engineers of the United States Army and of the boards of trade and chambers of commerce of various cities also contain statistics on this important feature of water commerce. But as the statistics contained in these various reports do not cover the operations of all vessels and were not compiled uniformly, they could not be used by the Census Office to show the total quantity of freight moved by all American craft during the census year. Those compiled by the Bureau of Statistics for the freight carried on the Great Lakes could, however, be used by the Census, and in order to make use of them and thus avoid duplication of work the Census schedule was made to correspond as nearly as possible with the schedule used by the Bureau of Statistics.

The Census inquiry was designed to obtain for each vessel a report of the quantity, in net tons, of all freight carried during the year 1906, classified by ports of shipment and receipt. The quantities for the following commodities were reported separately:

Canned goods.	Lumber.
Cement, brick, and lime.	Naval stores.
Coal.	Petroleum and other oils.
Cotton.	Phosphate and fertilizer.
Flour.	Pig iron and steel rails.
Fruits and vegetables.	Stone, sand, etc.
Grain.	Tobacco.
Ice.	Miscellaneous merchandise.
Iron ore.	

The collection of statistics of freight was perhaps attended by more difficulties than any other feature of the census. Many of the managing owners kept no record of the quantities of the different commodities carried and could therefore give only estimates in reply to the Census inquiry. The absence of all records was

most frequent in the case of vessels which operate on rivers and bays, and ship and discharge miscellaneous freight at numerous landings. Frequently package freight of this character is not weighed, and if the weight is taken no record of it is preserved. To meet cases where no record or estimate of the quantity of the different commodities could be obtained the schedule called for an "estimated total quantity of freight of all kinds shipped from ports during the year (tons of 2,000 pounds)," and a corresponding inquiry was made concerning the deliveries. It is believed that the managing owners or masters of vessels gave reasonably accurate estimates of the total tonnage carried during the year, even when unable to approximate the quantities of the different classes of merchandise.

Estimates and uncertainties of this character necessarily entered into the statistics of freight for the census of 1889, and a comparison of the totals for that census with those for 1906 should not be accepted as showing the actual increase. But such a comparison is of some value as an indication of general conditions.

**TABLE 39.**—*Freight transportation, including harbor traffic, by divisions: 1906 and 1889.*

DIVISION.	Census.	Freight carried (net tons).	Per cent of total.
Total.....	1906 1889	265,546,845 129,851,658	100.0 100.0
Atlantic coast and Gulf of Mexico.....	1906 1889	140,512,043 52,712,124	52.9 40.6
Pacific coast (including Alaska).....	1906 1889	17,622,816 11,240,927	6.6 8.7
Great Lakes and St. Lawrence river.....	1906 1889	175,610,690 25,266,974	28.5 19.5
Mississippi river and its tributaries.....	1906 1889	27,856,641 29,401,409	10.5 22.6
All other inland waters.....	1906 1889	3,944,655 11,221,224	1.5 8.6

<sup>1</sup>From the report of the Bureau of Statistics on the internal commerce of the United States.

In addition to the facts indicated above which should be considered in accepting the figures in this table, attention is called to the following:

The 265,546,845 net tons of freight reported for 1906 includes 88,026,046 tons, which is the estimated quantity carried on lighters and barges in and around harbors for all waters except the Great Lakes. This was necessary in order to obtain data as nearly as possible comparable with 1889. The statistics for the Great Lakes were compiled by the Bureau of Statistics, which does not take cognizance of harbor traffic. This class of freight does not appear to have been reported for the Great Lakes at the census of 1889, but it is presumed that at that census it was included in the statistics for all the other waters, though probably not as fully reported then as in 1906.

The figures for the Atlantic coast and the Gulf of Mexico include practically the same class of traffic at both censuses, with the exception of the harbor work



reported for ferryboats in 1906; this class of freight was omitted from the statistics for the division at the census of 1889.

The totals for the Pacific coast for 1889 include the freight carried on fishing vessels—that is, the provisions and supplies to the fishing grounds, and the catch of fish to the market or cannery. All fishing vessels and freight carried on them were excluded from the census of 1906. The freight represented by logs towed in rafts was also partially reported in 1889 but omitted entirely in 1906.

Freight carried between American and Canadian ports on the Great Lakes was included in 1889 but omitted in 1906.

The tonnage of freight transported in vessels of the United States in 1906 is more than double that reported for 1889, while the proportionate increases for the Atlantic coast and the Great Lakes are considerably larger. In this respect the Mississippi river system shows a small decrease, and “all other inland waters,” which is made up almost wholly of the canals of the country, shows a large decrease.

TABLE 40.—FREIGHT SHIPPED, BY COMMODITIES: 1906.

COMMODITY.	Total.	Atlantic coast and Gulf of Mexico.	Pacific coast (including Alaska). <sup>1</sup>	Great Lakes and St. Lawrence river. <sup>1</sup>	Mississippi river and its tributaries.	All other inland waters.
Canned goods.....net tons..	402,781	193,602	144,372	(2)	65,697	1,110
Cement, brick, and lime.....net tons..	5,165,051	4,738,177	251,677	(2)	95,443	70,754
Coal.....net tons..	49,109,005	19,149,753	451,781	17,575,467	11,033,011	890,593
Cotton.....net tons..	908,337	793,992	25,957	(2)	146,975	1,413
Flour.....net tons..	1,870,855	104,362	350,913	1,334,979	81,900	4,096
Fruits and vegetables.....net tons..	1,100,113	796,329	232,214	(2)	55,703	15,867
Grain.....net tons..	5,792,012	530,843	691,779	3,680,329	380,721	499,340
Ice.....net tons..	2,041,639	1,951,188	2,493	(2)	17,229	71,029
Iron ore.....net tons..	41,524,102	18,465	1,981,930	41,297,209	171,779	36,612
Lumber.....M. ft..	7,111,144	2,793,742	1,883,175	1,883,175	225,545	226,752
Naval stores.....net tons..	392,027	373,261	10,267	(2)	770	7,729
Petroleum and other oils.....bbls..	30,029,515	16,840,716	10,929,030	(2)	2,255,230	2,630
Phosphate and fertilizer.....net tons..	1,277,215	1,187,883	37,144	(2)	44,413	7,775
Pig iron and steel rails.....net tons..	1,165,825	664,758	19,861	414,110	55,346	11,750
Stone, sand, etc.....net tons..	14,659,972	7,394,354	2,340,008	(2)	4,004,259	924,351
Tobacco.....net tons..	281,892	165,776	2,115	(2)	114,000	1
Miscellaneous merchandise.....net tons..	32,592,973	18,580,196	3,536,392	* 7,305,390	2,385,418	785,577

<sup>1</sup> From the report of the Bureau of Statistics on the internal commerce of the United States.

<sup>2</sup> Included in “miscellaneous merchandise.”

<sup>3</sup> Includes canned goods, cement, brick, and lime, cotton, fruits and vegetables, ice, naval stores, petroleum and other oils, phosphate and fertilizer, stone, sand, etc., and tobacco.

Exact comparisons of the data shown in Table 40 can not be made with similar data for 1889, as it is impossible to separate the harbor traffic from the figures for the latter census. The statistics represent “shipments” of freight, in American vessels only, whether from domestic or from foreign ports. A similar table of “receipts” would vary in the aggregate for the United States but slightly from this, but owing to shipments from one division to another the totals for some of the divisions for certain commodities might differ considerably.

The statistics for the Great Lakes were obtained from the report of the Bureau of Statistics on the internal commerce of the United States. This report does not classify separately certain commodities which are classified separately on the Census schedules. Therefore the total for such commodities for the United States does not include the small amounts possibly shipped on the Great Lakes.

The statistics of freight movement on the inland waters as compiled by the Census do not agree with those contained in the reports of the chief of engineers of the United States Army, principally because the Census reports are for the calendar year, while the reports of the chief of engineers cover the fiscal year ending June 30, and also because the Census reports include neither the operation of boats under 5 tons nor the movement of rafted or floated material,

both of which are included in the reports of the War Department.

Judged by the tonnage moved, coal is the most important single item of merchandise in the water commerce of the United States. The movement is composed principally of shipments of hard coal from the railroad terminals on the coast of New Jersey and of soft coal from Atlantic coast ports farther south. Immense quantities of anthracite and bituminous coal are also carried westward on the Great Lakes from Lake Erie ports. The Mississippi river coal traffic is composed almost wholly of the shipment of soft coal on barges from the Pittsburg region to Cincinnati, Louisville, St. Louis, New Orleans, and other cities on the Mississippi river and its tributaries. All available statistics show that the movement of coal has increased remarkably since 1889 in all divisions except the Pacific coast. The coal taken from the New Jersey railroad terminals for consumption in and about Greater New York is treated as a part of the local traffic of that harbor, as it was found impossible to obtain accurate statistics of this movement. According to the best information obtainable, however, it almost equals the entire interport traffic in coal on the Atlantic coast and Gulf of Mexico. Bunker coal, loaded for use on the vessels, is not included in the Census reports.

Next to coal the greatest tonnage is shown for iron ore, although the transportation of this commodity on

the waters of the United States other than the Great Lakes is insignificant. The movement was greatest from ports on Lake Superior and on Lake Michigan, and was perhaps greater than that of any single commodity in an equally small field in any other part of the world. Iron ore shipments in 1889 amounted to only 8,279,032 tons, while in 1906 they amounted to 41,524,102 tons, an increase of over 400 per cent.

"Miscellaneous merchandise" embraces a multiplicity of articles, but disregarding these, building materials—stone, sand, brick, cement, and lime—form the third most important class of freight. Vast quantities of these materials are transported by water. The movement, moreover, is not localized, but reported for all waters where large cities create a demand for such materials.

The quantity of lumber or timber shipped by water in 1889 was 24,935,636 tons, or approximately 12,000,000 thousand feet, and in 1906 it was only 7,111,144 thousand feet, a very large decrease. Except for "all other inland waters" a decrease in lumber transportation is noted on all the waters of the United States. With the gradual exhaustion of the forests near the water courses, the lumber industry has been pushed so far into the interior that water transportation of the product is impracticable. The figures for 1889 included to some extent the movement of timber in rafts, which was omitted in 1906, because it was impossible to secure correct information concerning the quantity moved in this manner. This change in methods accounts for the apparent decrease in the quantity of lumber moved on the Pacific coast, as upon the waters of this division large quantities of timber are still shipped in the form of rafts. If the statistics of this movement in 1906 were fully reported, it would doubtless show a large increase over 1889.

The largest quantities of grain and flour are shown for the Great Lakes, the movement being eastward from Duluth, Superior, Chicago, and Milwaukee. Much of the grain reaches the seaboard for export by way of the Erie canal, and forms one of the most important items in the foreign trade of the country. The principal ports of shipment for exported breadstuffs are Boston, New York, Philadelphia, Baltimore, and Newport News on the Atlantic coast; New Orleans and Galveston on the Gulf; and San Francisco, Portland, and the Puget Sound ports on the Pacific.

The transportation of petroleum by water consists largely of exports of crude and refined oil from the customs districts of New York, Philadelphia, Wilmington, Del., Galveston, and San Francisco, and the coastwise movement of crude petroleum from the Texas oil territory to eastern ports for refining. The tank steamers employed in this commerce present probably the most economical method of water transportation.

The transportation of ice is confined largely to the Atlantic coast, and consists chiefly in the shipment of

the natural product from Maine and other New England states to southern cities, and from points on the Hudson river to New York city. The census of 1889 reports 2,692,873 tons of ice shipped on the Atlantic coast, while only 1,951,188 tons are reported for 1906. The decrease is due probably to the increase in the manufacture of ice, for which the gross value of products increased from \$4,900,983 in 1890 to \$23,790,045 in 1904.<sup>1</sup>

A large proportion of the phosphate and fertilizer produced in this country is transported by water, either in coastwise commerce or as exports. Much of the crude rock is either exported in that form or is transported from Florida or South Carolina to cities farther north for manufacture into the finished fertilizer. In no division except the Atlantic coast and Gulf of Mexico are phosphate and fertilizer carried by water to any considerable extent.

TABLE 41.—*Freight carried and income received for freight, exclusive of harbor work, by divisions: 1906.*

DIVISION.	Freight (net tons).	Per cent of total.	Income.	Per cent of total.
Total.....	177,520,799	100.0	\$175,545,361	100.0
Atlantic coast and Gulf of Mexico.....	65,360,958	36.8	83,890,161	47.8
Pacific coast (including Alaska). Great Lakes and St. Lawrence river.....	13,301,293	7.5	29,340,102	16.7
Mississippi river and its tribu- taries.....	175,610,690	42.6	52,076,533	29.7
All other inland waters.....	19,531,093	11.0	7,450,869	4.2
	3,716,765	2.1	2,787,696	1.6

<sup>1</sup> From the report of the Bureau of Statistics on the internal commerce of the United States.

The true relation of freight and income can not be determined without complete information in regard to the distances the freight was carried, the character of the commodities, the kind of vessels, and many other considerations that have an important bearing upon the subject. The Census schedule called for the distance sailed by each vessel during the year, but such a large number of shipowners declared their inability to furnish the information, that the inquiry was abandoned. The absence of such information renders it impossible to make any comparison of the tonnage and gross income from freight. The figures show, however, that the proportions in which the divisions contribute to the total income are very different from the proportions in which they contribute to the total quantity of freight. The Pacific coast contributes 7.5 per cent of the total quantity of freight as contrasted with 16.7 per cent of the total income, a fact which indicates that the average haul is longer and the work generally more costly than in other sections of the country. To a less degree the same conditions are apparent for the Atlantic coast and the Gulf of Mexico. On the other hand, the proportions for the Great Lakes and the Mississippi river are reversed, the amount of freight forming a much larger

<sup>1</sup> Census of Manufactures, 1905, Bulletin 83.

per cent of the total than the income. In both these divisions the bulky commodities—iron ore, grain, and coal on the Great Lakes, and coal on the Mississippi river—form overwhelming proportions of the total freight carried, and the charges in proportion to the tonnage and distance are very low. The conditions surrounding water transportation in different parts of the country are matters of common knowledge and confirm the general accuracy of the statistics.

Table 41 embraces all freight transported from one port to another, but does not include harbor work, lightering, etc. While the statistics reported for vessels engaged in harbor traffic are included in the general tables, the different varieties of merchandise transported by such craft between different points in the harbor were not reported. Shipmasters were not required to make a report of the various commodities thus transported, but did report the total quantity carried during the year, which is presented in Table 42.

TABLE 42.—Number of tons carried by vessels engaged in harbor work, by divisions: 1906.<sup>1</sup>

DIVISION.	Tons.
Total.....	88,026,046
Atlantic coast and Gulf of Mexico.....	75,151,085
Pacific coast (including Alaska).....	4,321,523
Mississippi river and its tributaries.....	8,325,548
All other inland waters.....	227,890

<sup>1</sup> This table does not include harbor freight on the Great Lakes.

The fact that harbor freight on the Great Lakes is not included should always be given due weight in accepting the statistics for this feature of water transportation. Harbor traffic about Chicago, Cleveland, Buffalo, Milwaukee, and other large cities on the Great Lakes is undoubtedly of immense proportions, and if the returns of such operations had been obtained, the total amount of harbor freight would be much larger than is shown in Table 42.

Nearly all the harbor work represented by the 88,026,046 tons of freight moved was reported for ports on the Atlantic coast and Gulf of Mexico. New York, with its long water front provided with docks and piers and navigable at almost all points for the largest vessels, and with its immense population, must necessarily require a large number of vessels to meet the demands for service of this character. It is safe to state that a very large proportion of the whole is represented by operations in that harbor. The single item of coal consumed in New York, particularly anthracite, practically all of which is transported from the railroad terminals in New Jersey, amounts to several millions of tons annually. All supplies for the city except those produced within its own borders, those delivered by the railroads entering at the north, and the limited amount coming from the outlying counties of Long Island, must be delivered by water.

A more detailed discussion of freight is reserved for the final report, which will give details for the several divisions and for the shipments and receipts of freight to and from foreign countries.

The value of the foreign trade of the United States is given for a series of years in Table 43, which shows the proportion in which this value was divided between American and foreign vessels.

Table 44 shows the tonnage of the sailing and steam vessels of the United States merchant marine, exclusive of fishing vessels, classified in accordance with the character of trade in which the tonnage was employed, whether coastwise or foreign.

TABLE 43.—Value of the foreign trade of the United States in American and foreign vessels: 1889 to 1906.<sup>1</sup>

YEAR ENDING JUNE 30—	Total.	In American vessels.	In foreign vessels.	Per cent in American vessels.
1889.....	\$1,420,868,649	\$203,805,108	\$1,217,063,541	14.3
1890.....	1,573,567,830	202,451,086	1,371,116,744	12.9
1891.....	1,650,540,812	206,459,725	1,450,081,087	12.5
1892.....	1,784,733,386	220,173,735	1,564,559,651	12.3
1893.....	1,626,082,075	197,765,507	1,428,316,568	12.2
1894.....	1,468,290,672	195,268,216	1,273,022,456	13.3
1895.....	1,456,408,388	170,507,196	1,285,906,192	11.7
1896.....	1,566,665,408	187,691,887	1,377,973,521	12.0
1897.....	1,714,829,043	189,075,277	1,525,753,766	11.0
1898.....	1,743,820,496	161,328,017	1,582,492,479	9.3
1899.....	1,806,876,063	160,612,206	1,646,263,857	8.9
1900.....	2,089,528,616	195,084,192	1,894,444,424	9.3
1901.....	2,151,935,411	177,398,615	1,974,536,796	8.2
1902.....	2,104,849,301	185,819,087	1,919,029,214	8.8
1903.....	2,240,801,420	214,695,032	2,026,106,388	9.6
1904.....	2,230,938,633	229,735,119	2,001,203,514	10.3
1905.....	2,393,809,408	290,607,946	2,103,201,462	12.1
1906.....	2,690,014,559	322,347,205	2,367,667,354	12.0

<sup>1</sup> Statistical Abstract of the United States, 1906, page 620.

TABLE 44.—Tonnage of the sail and steam vessels of the merchant marine of the United States employed in the foreign and coastwise trade, not including fishing vessels: 1889 to 1906.<sup>1</sup>

YEAR ENDING JUNE 30—	Total (tons).	Foreign (tons).	Coastwise (tons).
1889.....	4,211,035	999,619	3,211,416
1890.....	4,337,497	928,062	3,409,435
1891.....	4,598,595	988,719	3,609,876
1892.....	4,678,397	977,624	3,700,773
1893.....	4,737,892	883,199	3,854,693
1894.....	4,595,974	899,698	3,696,276
1895.....	4,551,061	822,347	3,728,714
1896.....	4,620,129	829,833	3,790,296
1897.....	4,689,696	792,870	3,896,826
1898.....	4,685,915	726,213	3,959,702
1899.....	4,802,542	837,229	3,965,313
1900.....	5,103,311	816,795	4,286,516
1901.....	5,462,240	879,595	4,582,645
1902.....	5,731,949	873,235	4,858,714
1903.....	6,020,301	879,264	5,141,037
1904.....	6,223,792	888,628	5,335,164
1905.....	6,385,438	943,750	5,441,688
1906.....	6,602,510	928,466	5,674,044

<sup>1</sup> Statistical Abstract of the United States, 1906, page 604.

#### PASSENGERS.

While the majority of the vessels included in the class of "freight and passenger" make a specialty of freight traffic, a considerable proportion of the gross earnings for the entire fleet is derived from the passenger service. During 1906 the income from this source amounted to \$43,645,365, or 14.8 per cent of the annual gross earnings for all craft.

TABLE 45.—*Number of passengers, by divisions: 1906 and 1889.*

DIVISION.	Cen- sus.	NUMBER OF PASSENGERS.		
		Total.	Ferry.	All other.
Total.....	1906	366,825,663	330,737,639	36,088,024
	1889	198,992,438	182,033,991	16,958,447
Per cent of increase.....		84.3	81.7	112.8
Atlantic coast and Gulf of Mexico....	1906	292,555,416	272,596,670	19,958,746
	1889	170,225,458	158,644,012	11,581,446
Per cent of increase.....		71.9	71.8	72.3
Pacific coast (including Alaska)....	1906	44,189,971	39,532,354	4,657,617
	1889	15,672,093	14,291,859	1,380,234
Per cent of increase.....		182.0	176.6	237.5
Great Lakes and St. Lawrence river.	1906	14,080,146	8,264,482	5,815,664
	1889	2,235,993	623,474	1,612,519
Per cent of increase.....		529.7	1,225.6	260.6
Mississippi river and its tributaries.	1906	14,122,241	10,022,612	4,099,629
	1889	10,858,894	8,474,646	2,384,248
Per cent of increase.....		30.0	18.3	71.9
All other inland waters.....	1906	1,877,889	321,521	1,556,368
	1889	( <sup>1</sup> )	( <sup>1</sup> )	( <sup>1</sup> )

<sup>1</sup> Not reported in 1889.

The 330,737,639 passengers carried by ferryboats during 1906 formed over nine-tenths of the total number carried by all classes of vessels, and the percentage of such passengers was somewhat less than in 1889. The greatest actual increase, 148,703,648, is shown for this class of passengers; but the largest percentage of increase, 112.8, occurred in the other class of passengers, which includes excursionists.

It would be of considerable interest if it were possible to ascertain from the returns the number of passengers that traveled by water for pleasure as distinguished from those traveling for business or other purposes, but such information could only be obtained from the individual passenger, and it would be impossible to secure the statistics in connection with a general census. It seems safe to assert, however, that, exclusive of ferry passengers, much the larger proportion of passengers is composed of summer excursionists taking short trips solely for pleasure.

Practically all the passengers reported were carried on steam passenger and ferry boats, but some were reported by vessels that were not engaged regularly in the passenger and freight business, such as tugboats, sailing vessels, and unrigged craft of various kinds. These passengers, altogether, numbered 785,447, of which 24,915 were carried on sailing vessels, and 760,532 on unrigged craft, towboats, etc.

The Atlantic coast and Gulf of Mexico is by far the most important district in the number of passengers, due in a large degree to the enormous number of ferry passengers carried about New York city and to the coastwise passenger traffic from this port. Large numbers of ferry passengers were also reported for Philadelphia and Boston. Passenger traffic on the Pacific coast, which is second in importance, centers in San Francisco bay, and is made up largely of ferry passengers in that neighborhood and of regular passengers to Portland, Seattle, and other coast cities.

In commenting on the statistics for passengers carried on the Great Lakes the report for 1889 states that "the figures of passenger traffic are interesting as far as they go, but it must be confessed that the returns were not made with that scrupulous care which characterized the schedule reports of traffic and equipment." It is evident from this that the statistics for that division are defective; presumably the full number was not reported, and the large percentage of increase, especially in ferry passengers, should not be accepted as representing the actual increase. The passenger service on these waters has, however, increased rapidly, probably in a greater ratio than for any other division.

In the annual reports of the United States Steamboat Inspection Service the number of passengers carried is reported for the various inspection districts, and the number reported by that office for the United States by all the vessels subject to its supervision in 1906 is 357,794,491. The different methods followed in collecting the statistics, and the fact that they were collected at different times, account in part for the discrepancy of about 9,000,000 between these totals. But the statistics for many vessels are necessarily estimates, and it is seldom that the same total can be obtained when compiled from different sources of information or at different times.

The tabulation of the census figures was not made with the idea of localizing the statistics of passenger traffic, but in a measure this is done in the reports of the Steamboat Inspection Service. Table 46, prepared from that source, presents the figures reported by the local inspectors for several of the more important inspection districts for 1906.

TABLE 46.—*Passengers reported for the principal districts of the United States Steamboat Inspection Service: 1906.<sup>1</sup>*

LOCAL INSPECTION DISTRICT.	Number of passengers.
Total.....	357,794,491
New York, N. Y.....	213,575,838
San Francisco, Cal.....	35,482,941
Philadelphia, Pa.....	32,228,294
Boston, Mass.....	17,665,329
Detroit, Mich.....	7,403,154
Norfolk, Va.....	5,964,799
New Orleans, La.....	4,030,718
Albany, N. Y.....	3,840,186
Baltimore, Md.....	3,702,873
Seattle, Wash.....	3,170,452
St. Louis, Mo.....	2,900,233
Providence, R. I.....	2,785,293
Portland, Me.....	2,372,900
Portland, Oreg.....	2,318,850
Chicago, Ill.....	1,818,194
Cincinnati, Ohio.....	1,649,038
Toledo, Ohio.....	1,565,056
New London, Conn.....	1,335,745
Point Pleasant, W. Va.....	1,297,152
Dubuque, Iowa.....	1,053,115
Duluth, Minn.....	1,051,074
All other.....	10,583,257

<sup>1</sup> Annual report of the Steamboat Inspector-General.

## IDLE VESSELS.

Craft that were not in operation during any portion of the year 1906 were considered as idle. Many of these craft are carried on the records of the Bureau of

Navigation of the Department of Commerce and Labor, but in this report the statistics for them are not included with those for the active craft. As the collection of data for idle craft was merely incident to the census, the enumeration of them was not as thorough as that of the active craft.

TABLE 47.—Idle vessels: 1906.

CLASS AND DIVISION.	Number of vessels.	Gross tonnage.	Value of vessels.
Total.....	1,762	179,326	\$10,511,363
Steam.....	830	99,897	8,735,852
Sail.....	565	20,014	936,890
Unrigged.....	367	59,415	838,621
Atlantic coast and Gulf of Mexico.....	1,074	87,254	6,895,147
Steam.....	450	49,131	5,801,871
Sail.....	475	11,971	780,405
Unrigged.....	149	26,152	312,871
Pacific coast (including Alaska).....	252	28,229	2,062,793
Steam.....	145	21,094	1,851,731
Sail.....	43	1,391	69,935
Unrigged.....	64	4,844	141,127
Great Lakes and St. Lawrence river.....	197	41,437	1,049,969
Steam.....	117	23,639	758,930
Sail.....	46	6,642	85,550
Unrigged.....	34	11,156	205,489
Mississippi river and its tributaries.....	171	15,038	310,685
Steam.....	100	4,482	256,220
Sail.....	71	10,556	54,465
Unrigged.....	71	10,556	54,465
Canals and other inland waters of New York state.....	32	5,121	128,869
Steam.....	9	330	28,600
Sail.....	1	10	1,000
Unrigged.....	22	4,781	99,269
All other inland waters.....	36	2,247	63,900
Steam.....	9	321	38,500
Sail.....	27	1,926	25,400
Unrigged.....	27	1,926	25,400

The majority of the 1,762 idle craft enumerated

were small and comparatively unimportant. The average tonnage per vessel for the entire number was 102 as compared with an average of 345 tons for the active vessels.

Income or earnings can not be considered a factor in estimating the value of idle craft, and the amount reported is necessarily an arbitrary value fixed by the owner. The average value per vessel was \$5,966 as compared with \$13,611 for active craft.

The comparatively large number of steam vessels reported as idle is due partly to the fact that they are of greater value than the sail or the unrigged vessels, not easily convertible into vessels of another character, and because of machinery and furnishings more liable to deterioration, hence when they go out of commission or suspend operations they are preserved so that they can be put into use again later. Steam vessels, too, were more easily located by the Census agents than were those of the other classes, which are more often laid up in waters that would not be visited for the purpose of finding active vessels, and therefore it is possible that more of them were missed in the canvass.

Another reason why the number of sail and unrigged craft reported as idle was not so great as for steam vessels, is the fact that these smaller craft of the first two classes, which have been idle for an entire year, are more liable to be considered as abandoned and therefore not included in the statistics.

#### PORTO RICO AND THE HAWAIIAN ISLANDS.

The statistics for the local shipping of these islands are not included in the totals for the United States, but are shown separately in Table 48.

TABLE 48.—VESSELS OPERATING LOCALLY AT PORTO RICO AND THE HAWAIIAN ISLANDS: 1906.

	PORTO RICO.				HAWAIIAN ISLANDS.			
	Total.	Steam.	Sail.	Unrigged.	Total.	Steam.	Sail.	Unrigged.
Number of vessels.....	205	4	43	158	52	26	10	16
Gross tonnage.....	5,566	94	905	4,567	10,682	8,828	592	1,262
Value of vessels.....	\$180,519	\$29,200	\$43,175	\$108,144	\$1,204,100	\$1,142,250	\$16,900	\$44,950
Gross income.....	\$227,031	\$7,600	\$42,258	\$177,173	\$1,488,090	\$1,424,702	\$12,042	\$51,346
Number of employees.....	603	16	132	455	767	685	43	39
Wages.....	\$121,533	\$5,381	\$24,861	\$91,291	\$428,679	\$401,215	\$9,044	\$18,420
Number of passengers carried.....	2,400	2,400	2,400	2,400	75,614	75,614	75,614	75,614
Freight carried (net tons).....	24,120	24,120	24,120	24,120	380,811	373,755	7,056	7,056

As the statistics for the craft covered by Table 48 were collected entirely by correspondence, the canvass was not as thorough as it was for other districts. In addition to the probability that some active craft failed to make reports, it is apparent that the statistics of income, employees, wages, passengers, and freight for the craft that did report are not complete.

#### CONDITIONS BETWEEN CENSUS YEARS.

All comparisons of data in this bulletin relate to the conditions during two periods of twelve months each

which are sixteen years apart. While these comparisons show that as a whole the American tonnage was very much larger in 1906 than it was in 1889, it does not follow that a constant increase was maintained from year to year in the number and tonnage of vessels. The most accurate information concerning the annual increase or decrease is contained in the reports of the Bureau of Navigation, Department of Commerce and Labor, which statistics for the registered, enrolled, and licensed vessels are reproduced in Table 49.



TABLE 49.—NUMBER AND TONNAGE OF REGISTERED, ENROLLED, AND LICENSED SAIL AND STEAM VESSELS CONSTITUTING THE TOTAL MERCHANT MARINE OF THE UNITED STATES, INCLUDING FISHING VESSELS: 1889 TO 1906.<sup>1</sup>

YEAR.	TOTAL MERCHANT MARINE.						ENROLLED AND LICENSED VESSELS, UNDER 20 TONS.						REGISTERED VESSELS.								
	Total.		Annual increase in tonnage (per cent).	Sail. <sup>2</sup>		Steam.	Total.		Annual increase in tonnage (per cent).	Sail. <sup>2</sup>		Steam.	Total.		Annual increase in tonnage (per cent).	Sail. <sup>2</sup>		Steam.			
	Number.	Tons.		Number.	Tons.		Number.	Tons.		Number.	Tons.		Number.	Tons.		Number.	Tons.				
1889.....	23,623	4,307,475	.....	17,699	2,541,924	5,924	1,765,551	21,942	3,285,880	.....	16,237	1,714,801	5,705	1,571,079	1,681	1,021,595	.....	1,402	827,124	219	194,471
1890.....	23,467	4,424,497	2.7	17,502	2,565,409	5,965	1,859,088	21,940	3,477,802	5.8	16,208	1,816,344	5,732	1,661,458	1,527	946,695	47.3	1,294	749,065	233	197,630
1891.....	23,899	4,684,759	5.9	17,683	2,668,495	6,216	2,016,264	22,312	3,678,809	5.8	16,367	1,902,540	5,945	1,776,209	1,587	1,005,950	6.2	1,316	765,955	271	239,965
1892.....	24,383	4,764,921	1.7	17,991	2,690,504	6,392	2,074,417	22,851	3,770,246	2.5	16,713	1,924,728	6,138	1,845,518	1,532	994,675	41.1	1,278	765,776	254	228,899
1893.....	24,512	4,825,071	1.3	17,951	2,641,799	6,561	2,183,272	23,169	3,925,268	4.1	16,857	2,003,099	6,312	1,922,169	1,343	899,803	49.5	1,094	638,700	249	261,103
1894.....	23,586	4,684,029	42.9	17,000	2,494,599	6,526	2,189,430	22,236	3,767,849	44.0	15,956	1,844,510	6,280	1,923,339	1,350	916,180	1.8	1,104	650,089	246	266,091
1895.....	23,240	4,635,960	41.0	16,686	2,423,159	6,554	2,212,801	21,980	3,797,773	0.8	15,665	1,837,017	6,315	1,960,756	1,260	838,187	48.5	1,021	586,142	239	252,045
1896.....	22,908	4,703,880	1.5	16,313	2,396,672	6,595	2,307,208	21,651	3,858,926	1.6	15,300	1,816,600	6,351	2,042,326	1,257	844,954	0.8	1,013	580,072	244	264,882
1897.....	22,633	4,769,020	1.4	16,034	2,410,462	6,599	2,358,558	21,403	3,963,436	2.7	15,051	1,863,352	6,352	2,100,084	1,230	805,584	44.6	983	547,110	247	258,474
1898.....	22,705	4,749,738	40.4	15,993	2,377,815	6,712	2,371,923	21,569	4,012,029	1.2	15,169	1,934,170	6,400	2,077,859	1,136	737,709	48.4	824	443,645	312	294,064
1899.....	22,728	4,864,238	2.4	15,891	2,388,227	6,837	2,476,011	21,397	4,015,992	0.1	14,927	1,900,011	6,470	2,115,981	1,331	848,246	15.0	964	488,216	367	360,030
1900.....	23,333	5,164,839	6.2	16,280	2,507,042	7,053	2,657,797	22,003	4,338,145	8.0	15,288	2,021,690	6,715	2,316,455	1,330	826,694	42.5	962	485,352	338	341,342
1901.....	24,057	5,524,218	7.0	16,643	2,603,265	7,414	2,920,953	22,730	4,635,089	6.8	15,671	2,143,858	7,059	2,491,231	1,327	889,129	7.6	972	459,407	355	429,722
1902.....	24,273	5,797,902	5.0	16,546	2,621,028	7,727	3,176,874	23,047	4,915,347	6.0	15,661	2,197,298	7,386	2,718,049	1,226	882,555	40.7	885	423,730	341	458,825
1903.....	24,425	6,087,345	5.0	16,371	2,679,257	8,054	3,408,088	23,255	5,198,569	5.8	15,558	2,317,891	7,697	2,880,678	1,170	888,776	0.7	813	361,666	357	527,410
1904.....	24,558	6,291,535	3.4	16,095	2,696,117	8,463	3,595,418	23,354	5,392,767	3.7	15,239	2,351,505	8,115	3,041,262	1,204	898,768	1.1	856	344,612	348	554,156
1905.....	24,681	6,456,543	2.6	15,784	2,715,049	8,897	3,741,494	23,309	5,502,030	2.0	14,792	2,361,716	8,517	3,140,314	1,372	954,513	6.2	992	353,333	380	601,180
1906.....	25,006	6,674,969	3.4	15,506	2,699,682	9,500	3,975,287	23,565	5,735,483	4.2	14,471	2,351,481	9,094	3,384,002	1,441	939,486	41.6	1,035	348,201	406	591,285

<sup>1</sup> From the report of the Commissioner of Navigation, Department of Commerce and Labor.

<sup>2</sup> Including canal boats and barges.

<sup>3</sup> Including barges.

<sup>4</sup> Decrease.

The figures for twelve of the years shown in Table 49 represent an increase over the preceding year in the number of vessels constituting the merchant marine, while the figures for five of the years represent a decrease. The largest percentages of increase occurred in 1900 and 1901. With the exception of three years, the tonnage increased over that of the preceding year. To this increase steam vessels have contributed most largely, as the tonnage of the sailing vessels shows an actual decrease during many years.

The enrolled and licensed vessels, which engage in trade on the coasts and inland waters, form the largest proportion of the merchant marine. In 1889 the tonnage of these vessels formed 76.3 per cent of the total, and this proportion has been increasing almost constantly each year until 1906, when it amounted to 85.9 per cent. With the exception of one year, 1894, there has been an actual increase each year in their tonnage.

Registered vessels are engaged primarily in foreign trade, and it is among this class of craft that the greatest decreases have occurred in both number and tonnage. The decrease, however, is in the sailing vessels, as the number and tonnage of the steam craft is larger in 1906 than in 1889. Not only has the proportion which registered vessels formed of the total merchant marine decreased, but during nine of the years there was an actual decrease in their tonnage. In 1906 as compared with 1889 there was a decrease of 240 in the number of these vessels and of 82,109 in their tonnage. The smallest registration, 737,709 tons, was reported for 1898, since which date there has been a slight increase except in 1900, 1902, and 1906. The largest registration reported for the period covered by the table, 1,021,595 tons, is shown for 1889.

In this connection it is interesting to know that 1,183 vessels, of 941,864 tonnage, valued at \$87,503,676, reported to the Census that they carried freight to or from foreign ports during all or a portion of the year 1906. This, however, does not include the vessels operating on the Great Lakes, considerable numbers of which touch at Canadian ports, but it does include 523 canal boats, of 55,034 tonnage, valued at \$584,190, which operate on the Champlain canal and Lake Champlain and visit ports in Canada. Of the 1,183 vessels, 489, of 538,082 tonnage, valued at \$52,329,924, operated on the Atlantic coast, and 171, of 348,748 tonnage, valued at \$34,589,562, on the Pacific coast.

#### CANAL BOATS.

For the purpose of this report all boats operated by the use of machinery have been included in the group of steam vessels, which therefore includes some ordinarily classed as canal boats. With this exception, the statistics for canal boats given in Table 50 represent all craft commonly known as such, although they may have been actually employed on canals during only a portion of the year 1906.

At the census of 1906 reports were secured for canal boats, irrespective of the waters in which they operated. In 1889 reports for such boats were secured in connection with other information obtained for the operations of the canals from the canal commissioners and other officers who have general supervision of the canal property. Comparative statistics are given in Table 60, which represents the floating equipment as reported by the officials in charge of the various canals. A comparison of the available data indicates that the number and tonnage of canal boats have been constantly decreasing. More than three-



fifths of them are now operated on the canals and other waters of New York state. Numbers of these boats winter in New York harbor, and are used for conveying freight on the surrounding waters and between points on the coast. The 8 canal boats reported for the Great Lakes and the Mississippi river are used as harbor barges and could properly be classed as such.

TABLE 50.—Canal boats, by divisions: 1906.<sup>1</sup>

DIVISION.	Number of vessels.	Gross tonnage.	Value of vessels.	Gross income.	Number of employees.	Wages.
Total.....	2,237	303,581	\$2,952,197	\$3,338,347	2,772	\$1,015,591
Atlantic coast and Gulf of Mexico.....	663	103,877	1,112,475	943,552	652	281,599
Great Lakes and St. Lawrence river.....	6	1,134	13,800	7,790	15	2,801
Mississippi river and its tributaries.....	2	323	4,100	12,500	8	2,000
Canals and other inland waters of New York state.....	1,364	173,388	1,583,835	2,049,277	1,582	588,672
All other inland waters.....	202	24,859	237,987	325,228	515	140,519

<sup>1</sup> This table does not include steam canal boats.

<sup>2</sup> Does not include 49 boats with 5,745 gross tonnage that were idle during the entire year.

There were 138 steam canal boats reported at the census of 1889, of 14,676 tonnage, valued at \$453,000. The statistics for steam craft of this class as reported for the census of 1906 are presented in Table 51.

TABLE 51.—Steam vessels operating on canals: 1906.

	1906
Number of vessels.....	84
Gross tonnage.....	7,280
Value of vessels.....	\$418,800
Gross income.....	\$370,101
Number of employees.....	362
Wages.....	\$145,701
Freight carried (net tons).....	189,522

There has been a decided decrease in the number of canal boats since the census of 1889, and while it is possible that the number propelled by steam decreased from 138 to 84, it may be that some boats of this class which operated on canals and also on other waters were classed as canal boats in 1889 but as steam vessels other than canal boats in 1906. The figures for the two censuses should therefore not be used to show the increase or decrease.

#### CANALS AND CANALIZED RIVERS.

In connection with the statistics for canal boats it is important to present information for the waters on which they are operated. For convenience the data for canals and canalized rivers will be considered as representing one general group. Canals may be divided into three classes, according as they are owned and operated by the Federal Government, by state governments, or corporations.

Canalized rivers are streams which have been made navigable, or on which navigation has been improved, by the construction of locks or dams. In all in-

stances, except on the Illinois river at Henry and Copperas creek, the locks on the canalized rivers are owned and operated by the Federal Government, which either constructed or purchased them. While most of the state and corporation canals are used only for the transportation of freight in canal boats, the Government canals are all ship canals and the canalized rivers are classed as such.

All data in this report relative to canals or canalized rivers operated by the Federal Government are for the fiscal year ending June 30, unless otherwise noted, and were obtained from the annual reports of the chief of engineers of the United States Army; those for state and corporation canals are for the calendar year and were obtained directly from the canal officials.

TABLE 52.—Number, mileage (including slack water), and cost of canals and canalized rivers in the United States: 1906, 1889, and 1880.

	Total.	State and corporation canals.	Government canals.	Canalized rivers.
Number:				
1906.....	64	29	12	23
1889.....	67	37	9	21
1880.....	52	39	2	11
Mileage:				
1906.....	3,644.60	2,046.01	78.19	1,520.40
1889.....	3,383.27	2,264.60	40.63	1,078.04
1880.....	3,235.78	2,746.18	10.00	479.60
Cost:				
1906.....	\$283,208,863	\$213,797,297	\$26,524,588	\$42,886,978
1889.....	188,185,880	150,481,825	20,517,133	17,186,922
1880.....	183,952,302	167,205,810	7,832,009	8,914,483

While there has been a decrease of 700.17 miles since 1880 in the mileage of canals operated under state and corporation ownership, the mileage of canals owned by the Federal Government increased 68.19 miles, and that of canalized rivers 1,040.80 miles. The net increase in mileage of canals and canalized rivers in 1906 over 1880 is 408.82 miles. In order, however, to show the total increase since the latter census, the mileage of canals abandoned since 1880 should be considered.

TABLE 53.—Length and cost of abandoned canals and canalized rivers: 1906, 1889, and 1880.

	Length (miles).	Cost of construction and improvement.
Total.....	2,841.27	\$73,168,795
Abandoned canals up to 1880.....	1,953.56	44,013,166
Abandoned canals, 1880 to 1889.....	261.69	7,157,850
Abandoned canals, 1889 to 1906.....	626.02	21,997,779

The mileage of canals and canalized rivers abandoned since 1880 amounts to 887.71 miles, which, added to the 408.82 miles of increase given in Table 52, shows an increase of 1,296.53 miles of canals or canalized rivers operated since 1880.

Between 1889 and 1906 there were 626.02 miles of canals and canalized rivers abandoned, while the in-

crease in mileage shown in Table 52 amounts to 261.33, indicating an increase of 887.35 miles of canals or canalized rivers operated since the Eleventh Census. In 1889, however, the Chesapeake and Ohio canal, built and enlarged during the period from 1828 to 1850, with a length of 186 miles, inclusive of 5 miles of slack water, was omitted, as the canal was not operated during that year. The actual increase in mileage, therefore, in 1906 over 1889 would be but 701.35 miles.

Since 1880 there has been a large decrease in the mileage of canals operated by states or corporations, and an increase in the mileage of Government canals and canalized rivers which, with the exceptions already mentioned, are controlled by the Federal Government.

Of the 626.02 miles of canals and canalized rivers abandoned since the Eleventh Census, 522.32 miles were state or corporation canals and 103.70 miles canalized rivers.

TABLE 54.—Name, length, and cost of construction of canals and canalized rivers abandoned between 1889 and 1906.

STATE AND NAME.	Length (miles).	Cost to and including 1889.
Aggregate.....	626.02	\$21,997,779
State and corporation canals.....	522.32	21,045,950
New York:		
Erie and branches (part).....	26.28	.....
Delaware and Hudson (part).....	102.00	6,274,210
New Jersey:		
Penns Neck.....	2.02	41,000
Pennsylvania:		
Pennsylvania.....	193.00	7,731,750
Susquehanna and Tidewater.....	45.00	4,931,345
Muncy.....	0.75	7,077
Schuylkill Navigation Company (part).....	18.35	.....
Virginia:		
Albemarle and Chesapeake (part).....	29.94	.....
Dismal Swamp (part).....	6.00	.....
North Carolina:		
Fairfield (part).....	0.50	.....
Illinois:		
Illinois and Michigan (part).....	6.00	.....
Georgia:		
Ogeechee.....	16.00	407,818
Florida:		
Santa Fe.....	10.50	70,000
Ohio:		
Walhonding.....	19.00	607,269
Hocking.....	42.00	975,481
Miami and Erie (part).....	5.00	.....
Canalized rivers.....	103.70	951,829
Maine:		
Songo.....	7.00	20,000
New York:		
Black.....	42.50	.....
Oneida.....	20.00	368,164
Seneca.....	7.70	.....
Pennsylvania:		
Beaver.....	6.00	19,000
Virginia:		
Upper Appomattox.....	11.50	388,617
Wisconsin:		
Chippewa.....	9.00	156,048

The cost of the improvements abandoned between 1889 and 1906 for which cost is shown amounted to \$21,997,779. This sum is low, however, as the cost of abandoned portions, which can not be estimated, must have been considerable.

The cost of the canals and canalized rivers in operation in 1906 amounted to \$283,208,863, and the cost of similar improvements abandoned up to that year was

\$73,168,795, making a grand total of \$356,377,658 expended by the Federal Government, by states, or corporations, on canals or the canalization of rivers.

The comparatively small increase in mileage and cost between 1880 and 1889 is probably due to the exclusion in the latter year of the Chesapeake and Ohio canal. The inclusion at the present census of this canal, as well as the Chicago Drainage and Ship canal, which was only completed in 1900, accounts in a great measure for the large increase in cost of these public waterways in 1906 as compared with 1889. The Chesapeake and Ohio canal is reported as having cost, with improvements, \$14,000,000, and the Chicago Drainage and Ship canal \$52,697,495.

For none of the Government canals or the canalized rivers under Government control is any income or expense account shown, although both classes of waterways require an expenditure for maintenance. For the fiscal year ending June 30, 1906, the amount allotted under the permanent indefinite appropriation, provided by the act of July 5, 1884, for the care and maintenance of Government canals and canalized rivers was \$1,108,710. No tolls were charged on the waterways under Federal control. Neither are any tolls charged on the canals owned and operated by the state of New York. The canals of New York state were maintained by taxation and the charge for maintenance for the fiscal year ending September 30, 1906, amounted to \$1,191,171.

Of the remaining 24 canals under state or corporation ownership, 3, the Chicago Drainage and Ship canal, the Newbern and Beaufort canal, and the Morris and Cummings canal, did not report any income or expenditure for 1906, and such items for the Illinois and Michigan canal could not be separated from the records for the locks on the Illinois river at Henry and Copperas creek, which are operated by the state of Illinois. The 20 canals which did report income and expense derived a total revenue of \$1,235,608 and were operated at a cost of \$1,281,361.

TABLE 55.—Tons of freight carried on state and corporation canals, Government canals, and canalized rivers: 1906, 1889, and 1880.

[The figures in this table represent the freight tonnage carried on the canals of the United States, each canal being regarded as a single unit.]

CLASS.	1906	1889	1880
Total.....	122,434,405	48,668,325	21,044,292
State and corporation canals.....	6,606,814	13,269,600	16,304,323
Government canals.....	96,729,333	28,904,209	1,244,279
Canalized rivers.....	19,098,258	6,494,516	3,495,690

The amount of freight carried on the canals and canalized rivers in 1906 exceeded that carried in 1889 by 73,766,080 tons, or 151.6 per cent, and exceeded that carried in 1880 by 101,390,113 tons, or 481.8 per cent.

While there is a decrease of 50.2 per cent since 1889 and of 59.5 per cent since 1880 in the amount of freight

carried on state and corporation canals, the increased tonnage carried on Government canals amounted to 234.6 per cent more than in 1889 and 7,673.9 per cent more than in 1880, and that carried on canalized rivers was 194.1 per cent greater than in 1889 and 446.3 per cent greater than in 1880.

Of all the freight, a little over 75 per cent passed through the St. Clair Flats canal, which connects Lake St. Clair with the St. Clair river, and the St. Marys Falls canal, which connects Lake Superior with Lake Huron. These two canals are controlled and operated by the Federal Government.

There is necessarily a duplication in the total quantity of freight carried on all canals; for example, a large proportion of the freight reported for the St. Marys Falls canal is included in the report for the St. Clair Flats canal and duplicated when the totals for the canals are combined.

In 1906 the freight tonnage passing through the St. Clair Flats canal aggregated 51,359,071 tons, an increase over 1889 of 160.5 per cent. The freight tonnage carried through the canal around St. Marys Falls in 1880 was only 1,244,279 tons; in 1889 it amounted to 7,516,022 tons; while in 1906 it was 41,276,862 tons, or 3,217.3 per cent greater than in 1880 and 449.2 per cent more than in 1889.

TABLE 56.—*Net tonnage of vessels and total freight passing through both American and Canadian canals at Sault Ste. Marie: 1895 to 1906.*<sup>1</sup>

YEAR.	Net registered tonnage.	Total freight (tons).
1906.....	37,570,191	46,015,016
1905.....	36,617,699	44,270,680
1904.....	24,364,138	31,546,106
1903.....	27,736,444	34,674,437
1902.....	31,955,582	35,961,146
1901.....	24,626,976	28,403,065
1900.....	22,315,834	25,643,073
1899.....	21,958,347	25,255,810
1898.....	18,622,754	21,234,664
1897.....	17,619,933	18,982,755
1896.....	17,249,418	16,239,061
1895.....	16,806,781	15,062,580

<sup>1</sup> This table is compiled from the annual report of the Chief of Engineers of the United States Army, for the fiscal year ending June 30, 1906.

The American canal at Sault Ste. Marie was first opened to navigation in 1855, and during that year the vessels passing through the canal carried 14,503 tons of freight. Up to 1895 the freight that passed through the canal amounted to 101,244,462 tons, while from 1895 to 1906 it amounted to 343,288,393 tons, making a grand total of 444,532,855 tons of freight from the opening in 1855 to June 30, 1906.

TABLE 57.—*Net tons of freight carried on ship canals and all other canals: 1906, 1889, and 1880.*

[The figures in this table represent the freight tonnage carried on the canals of the United States, each canal being regarded as a single unit.]

	1906	1889	1880
Total.....	122,434,405	48,668,325	21,044,292
Ship canals.....	118,114,267	38,905,820	5,076,391
All other.....	4,320,138	9,762,505	15,967,901

Of the total freight carried on canals during 1880, 24.1 per cent was transported on ship canals and 75.9 per cent on other canals; in 1889 the corresponding figures were 79.9 per cent and 20.1 per cent; in 1906 they were 96.5 per cent and 3.5 per cent. These figures show the decrease in the transportation of freight in canal boats and the tendency to use ship canals through which larger vessels can pass rather than the old style towpath canal of narrow width and little depth.

TABLE 58.—*Net tonnage of vessels on St. Marys Falls, Suez, and Kaiser Wilhelm canals: 1895 to 1906.*<sup>1</sup>

ST. MARYS FALLS. <sup>2</sup>		SUEZ.		KAISER WILHELM.	
Calendar year.	Net tonnage.	Calendar year.	Net tonnage.	Year ending March 31—	Net tonnage. <sup>3</sup>
1895.....	16,806,781	1895.....	8,448,383	1895.....	41,505,983
1896.....	17,249,418	1896.....	8,560,284	1896.....	1,848,458
1897.....	17,619,933	1897.....	7,899,374	1897.....	2,469,795
1898.....	18,622,754	1898.....	9,238,603	1898.....	3,117,840
1899.....	21,958,347	1899.....	9,895,630	1899.....	4,282,094
1900.....	22,315,834	1900.....	9,738,152	1900.....	4,285,301
1901.....	24,626,976	1901.....	10,823,840	1901.....	4,573,834
1902.....	31,955,582	1902.....	11,248,413	1902.....	4,990,287
1903.....	27,736,444	1903.....	11,907,288	1903.....	5,270,477
1904.....	24,364,138	1904.....	13,401,835	1904.....	5,796,949
1905.....	36,617,699	1905.....	13,132,604	1905.....	
1906.....	41,098,324	1906.....	13,443,382	1906.....	

<sup>1</sup> The figures for this table are compiled from the Monthly Summary of Commerce and Finance of the United States, Bureau of Statistics, Department of Commerce and Labor, from the reports of the British Statistical Department, Ministry of Finance, and from the Quarterly Statistical Reports of Germany.

<sup>2</sup> Traffic through the Canadian canal is included in these figures.

<sup>3</sup> Not including German war vessels and vessels of the canal administration.

<sup>4</sup> Covers July 1, 1895, to June 30, 1896 (the first year after opening).

Although the Suez canal is usually considered the most important example of ship canals, the net tonnage of vessels passing through it is much less than that of vessels passing through St. Marys Falls canal. In 1906 the net tonnage of vessels passing through St. Marys Falls canal was over three times as great as that for the Suez canal, and over seven times as great as that for the Kaiser Wilhelm, or Kiel, canal. This is all the more remarkable in consideration of the fact that while the Suez and Kiel canals are open for the entire year, the St. Marys Falls canal, because of the severity of the winter, is open to traffic for only about eight months. The St. Marys Falls canal is also remarkable because of its short length, number of locks, and immense traffic.

TABLE 59.—*Dimensions and cost of construction of Suez, Manchester, Kaiser Wilhelm, and St. Marys Falls canals.*<sup>1</sup>

CANAL.	Length (miles).	Depth (feet).	Locks (number).	Cost.
Suez.....	90.0	31.0	.....	\$100,000,000
Manchester.....	35.5	26.0	4	75,000,000
Kaiser Wilhelm.....	61.0	29.5	2	40,000,000
St. Marys Falls.....	2.7	25.0	3	13,000,000

<sup>1</sup> The figures for this table are compiled from the Monthly Summary of Commerce and Finance of the United States for January, 1905, Bureau of Statistics, Department of Commerce and Labor.

<sup>2</sup> Tidal locks.

<sup>3</sup> Includes cost of Canadian lock and approaches, which was obtained from the annual report of the Chief of Engineers of the United States Army for the fiscal year ending June 30, 1906.

No reliable data were obtainable as to the number, tonnage, or valuation of boats using the waterways

classified as ship canals. Table 60 shows such data only for those canals operated in 1906 on which the freight is transported by canal boats and which are all under state or corporation ownership.

TABLE 60.—*Floating equipment—number, tonnage, and valuation of canal boats on other than ship canals: 1906 and 1889.*

CANAL.	1906			1889		
	Number.	Tonnage.	Valuation.	Number.	Tonnage.	Valuation.
Total.....	(1)	465,515	(1)	5,544	808,058	\$4,823,625
Chesapeake and Ohio	120	13,920	\$84,000	(2)	(2)	(2)
Morris.....	(3)	(3)	(3)	314	24,120	92,275
Delaware and Hud-						
son.....	18	2,700	18,000	750	105,000	681,500
Erie.....						
Oswego.....	(1)	358,905	(1)	1,743	406,061	2,403,500
Cayuga and Seneca						
Champlain.....	540	54,000	648,000	954	97,597	893,450
Black River.....	63	6,300	77,331	110	10,345	94,950
Ohio.....	(3)	(3)	(3)	275	22,000	82,500
Miami and Erie.....						
Lehigh Coal and						
Navigation Com-						
pany.....	127	15,500	63,000	1,273	120,935	509,200
Schuylkill Naviga-						
tion Company.....	42	6,190	30,200	125	22,000	66,250

<sup>1</sup> The number and valuation of boats operating on the Erie, Oswego, Cayuga and Seneca canals were not reported and therefore no total could be made for these items.

<sup>2</sup> Not in operation in 1889.

<sup>3</sup> Did not report floating equipment in 1906.

Of the 12 canals for which floating equipment is shown, 7 are operated by the states in which they are located and 5 by corporations. The great decrease in the number, tonnage, and valuation of the boats using these canals in 1906 as compared with 1889 is due to the decreased use of canals whose dimensions and locks do not permit boats of large tonnage to pass.

TABLE 61.—*Tons of freight carried on state and corporation canals, Government canals, and canalized rivers: 1906, 1889, and 1880.<sup>1</sup>*

STATE AND NAME.	1906	1889	1880
Aggregate.....	122,434,405	48,668,325	21,044,292
State and corporation canals.....	6,606,814	13,269,600	16,304,323
Government canals.....	96,729,333	28,904,209	1,244,279
Canalized rivers.....	19,098,258	6,494,516	3,495,690
State and corporation canals.....	6,606,814	13,269,600	16,304,323
New York.....	3,627,907	6,816,304	7,766,969
Erie and branches.....	2,385,491	3,673,554	4,608,651
Champlain.....	740,983	1,187,038	1,200,503
Oswego.....	172,228	170,078	427,863
Cayuga and Seneca.....	164,874	196,138	125,331
Black River.....	77,331	143,561	75,308
Delaware and Hudson.....	87,000	1,445,935	1,329,313
New Jersey.....	513,043	1,738,905	1,857,568
Delaware and Raritan.....	424,986	1,276,269	1,348,082
Morris.....	88,057	462,636	503,486
Penns Neck.....	(2)	(3)	6,000
Pennsylvania.....	294,979	1,359,665	2,607,535
Pennsylvania.....	(2)	423,073	861,798
Susquehanna and Tidewater.....	(2)	125,555	362,295
Schuylkill Navigation Co.....	54,354	219,697	630,416
Lehigh Coal and Navigation Co.....	240,625	591,340	719,338
Union.....	(2)	(3)	29,853
Muncy.....	(2)	(3)	3,835

<sup>1</sup> The figures relating to Government canals and canalized rivers were obtained from the report of the Chief of Engineers of the United States Army for the fiscal year ending June 30, 1906, and those for state and corporation canals directly from the canal officials.

<sup>2</sup> Abandoned since 1889.

TABLE 61.—*Tons of freight carried on state and corporation canals, Government canals, and canalized rivers: 1906, 1889, and 1880—Continued.*

STATE AND NAME.	1906	1889	1880
Delaware:			
Chesapeake and Delaware.....	683,086	736,879	959,146
Virginia.....	435,404	395,004	532,662
Albemarle and Chesapeake.....	95,269	316,793	400,000
Lake Drummond (Dismal Swamp).....	340,135	78,211	6,731
Alexandria and Georgetown.....	(4)	(4)	125,931
North Carolina.....		2,124	40,000
Fairfield.....	(3)	2,124	40,000
Newbern and Beaufort.....	(3)	(3)	(3)
Georgia.....	7,004	40,392	23,602
Augusta.....	7,004	23,668	2,697
Ogeechee.....	(2)	16,724	20,905
Louisiana.....	683,900	293,070	318,096
New Basin.....	500,000	226,594	177,108
Old Basin.....	60,000	66,476	140,988
Harvey's.....	50,000	(3)	(3)
Company's.....	50,000	(3)	(3)
Secolas.....	(2)	(3)	(3)
Lake Borne.....	23,900	(5)	(5)
Ohio.....	84,052	1,107,176	791,962
Ohio and branches.....	8,818	129,398	429,626
Walhonding.....	(2)	948	3,309
Hocking.....	(2)	7,353	35,290
Miami and Erie.....	75,234	969,477	323,737
Illinois.....	6,470	742,391	751,360
Illinois and Michigan.....	6,470	742,391	751,360
Chicago Drainage and Ship.....	(3)	(3)	(3)
Maryland:			
Chesapeake and Ohio.....	225,143	(6)	655,423
Florida:			
Santa Fe.....	(2)	1,000	(3)
Oregon:			
Portland General Electric Co.....	43,826	36,690	(3)
Texas:			
Morris and Cummings.....	2,000	(3)	(3)
Government canals.....	96,729,333	28,904,209	1,244,279
Kentucky:			
Louisville and Portland.....	1,053,526	618,060	(3)
Iowa:			
Des Moines Rapids.....	8,520	794,280	(3)
Michigan.....	95,049,378	27,491,869	1,244,279
St. Marys Falls.....	41,276,862	7,516,022	1,244,279
Lake Superior.....	2,413,445	257,987	(3)
St. Clair Flats.....	51,359,071	19,717,860	(3)
Illinois:			
Illinois and Mississippi.....	699	(5)	.....
Wisconsin:			
Sturgeon Bay and Lake Michigan.....	617,210	(3)	(3)
Texas:			
Port Arthur.....	(3)	(5)	.....
Galveston and Brazos.....	(3)	(3)	(3)
Morgan.....	(3)	(3)	(5)
South Carolina:			
Fenwicks Island.....	(3)	(5)	.....
Esterville-Minim Creek.....	(3)	(5)	.....
Canalized rivers.....	19,098,258	6,494,516	3,495,690
Pennsylvania.....	16,091,000	3,294,932	3,450,400
Monongahela-Pennsylvania and West			
Virginia.....	11,447,444	3,294,932	3,450,400
Ohio.....	3,247,753	(3)	(3)
Allegheny.....	1,395,803	(5)	(5)
Ohio:			
Muskingum.....	50,668	10,281	45,290

<sup>2</sup> Not reported.

<sup>3</sup> Abandoned since 1880.

<sup>4</sup> Not opened.

<sup>5</sup> Canal not in operation in 1889.

<sup>6</sup> Fiscal year ending June 30, 1905.

<sup>7</sup> Includes Keweenaw Bay and Portage Lake canals.

TABLE 61.—Tons of freight carried on state and corporation canals, Government canals, and canalized rivers: 1906, 1889, and 1880—Continued.

STATE AND NAME.	1906	1889	1880
West Virginia.....	1,720,399	1,260,859	.....
Great Kanawha <sup>1</sup> .....	1,613,889	1,145,202	( <sup>2</sup> )
Little Kanawha <sup>1</sup> .....	106,510	115,657	( <sup>2</sup> )
Monongahela.....	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )
Kentucky.....	729,428	1,076,228	.....
Kentucky <sup>1</sup> .....	201,510	256,950	( <sup>2</sup> )
Green and Barron.....	342,495	819,278	( <sup>2</sup> )
Big Sandy <sup>1</sup> .....	148,623	( <sup>2</sup> )	( <sup>2</sup> )
Rough.....	36,800	( <sup>2</sup> )	( <sup>2</sup> )
Illinois.....	33,178	180,264	.....
Illinois.....	24,943	180,264	( <sup>2</sup> )
Wabash.....	3,990	( <sup>2</sup> )	( <sup>2</sup> )
Galena.....	4,245	( <sup>2</sup> )	( <sup>2</sup> )
Wisconsin.....	263,589	671,952	.....
Fox <sup>1</sup> .....	263,589	345,475	( <sup>2</sup> )
Chippewa.....	( <sup>2</sup> )	325,477	( <sup>2</sup> )

<sup>1</sup> Fiscal year ending June 30, 1905.

<sup>2</sup> Not reported.

TABLE 61.—Tons of freight carried on state and corporation canals, Government canals, and canalized rivers: 1906, 1889, and 1880—Continued.

STATE AND NAME.	1906	1889	1880
South Carolina:			
Congaree.....	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )
Arkansas:			
Upper White.....	7,999	( <sup>2</sup> )	( <sup>2</sup> )
Tennessee.....	136,805	.....	.....
Cumberland <sup>1</sup> .....	119,009	( <sup>2</sup> )	( <sup>2</sup> )
Muscle Shoals <sup>1</sup> (Tennessee).....	17,796	( <sup>2</sup> )	( <sup>2</sup> )
Alabama.....	16,281	.....	.....
Black Warrior.....	16,281	( <sup>2</sup> )	( <sup>2</sup> )
Coosa.....	( <sup>2</sup> )	( <sup>2</sup> )	( <sup>2</sup> )
Oregon.....	48,911	.....	.....
Columbia.....	46,884	( <sup>2</sup> )	( <sup>2</sup> )
Yamhill.....	2,027	( <sup>2</sup> )	( <sup>2</sup> )

<sup>1</sup> Included in data for this river in Pennsylvania.

<sup>2</sup> Abandoned since 1889.

<sup>3</sup> Not opened.

TABLE 62.—NUMBER, DIMENSIONS, DATE OF CONSTRUCTION, AND COST OF STATE AND CORPORATION CANALS, GOVERNMENT CANALS, AND CANALIZED RIVERS: 1906.<sup>1</sup>

STATE AND NAME.	Points connected.	Number of canals.	Opened for traffic.	LENGTH.			WIDTH.		Depth (feet).	LOCKS.			Cost of construction and improvement.
				Total (miles).	Canal (miles).	Slack water (miles).	Surface (feet).	Bottom (feet).		Number.	Length (feet).	Width (feet).	
Aggregate.....		64	.....	3,644.60	2,022.88	1,621.72	.....	.....	.....	934	.....	.....	\$283,208,863
State and corporation canals.....		29	.....	2,046.01	1,949.09	96.92	.....	.....	.....	784	.....	.....	213,797,297
Government canals.....		12	.....	78.19	73.79	4.40	.....	.....	.....	12	.....	.....	26,524,588
Canalized rivers.....		23	.....	1,520.40	.....	1,520.40	.....	.....	.....	138	.....	.....	42,886,978
State and corporation canals.....		29	.....	2,046.01	1,949.09	96.92	.....	.....	.....	784	.....	.....	213,797,297
New York.....		6	.....	549.90	539.90	10.00	.....	.....	.....	242	.....	.....	76,825,458
Erie and branches <sup>2</sup> .....	Albany-Buffalo.....	1825	.....	355.13	355.13	.....	70	56	7	72	110	18	65,402,033
Champlain <sup>2</sup> .....	Whitehall-Albany.....	1822	.....	81.00	73.00	8.00	50	35	5	23	110	18	
Oswego <sup>2</sup> .....	Oswego-Syracuse.....	1828	.....	38.00	38.00	.....	70	56	7	18	110	18	
Cayuga and Seneca <sup>2</sup> .....	Montezuma-Geneva.....	1839	.....	24.77	22.77	2.00	70	56	7	10	110	18	
Black River and feeders <sup>3</sup> .....	Rome-Lyons Falls.....	1849	.....	42.00	42.00	.....	42	28	4	109	90	15	3,964,000
Delaware and Hudson.....	Eddyville-High Falls.....	1828	.....	9.00	9.00	.....	50	30	7	10	100	15	65,000
New Jersey.....		3	.....	172.00	172.00	.....	.....	.....	.....	49	.....	.....	11,113,749
Delaware and Raritan <sup>3</sup> .....	New Brunswick-Bordentown.....	.....	1838	44.00	44.00	.....	80	40	9	13	220	24	5,113,749
Delaware and Raritan feeder.....	Bull Island-Trenton.....	.....	.....	22.00	22.00	.....	60	30	9	4	100	24	
Morris.....	Jersey City-Easton, Pa.....	.....	1836	106.00	106.00	.....	50	30	5	32	95	20	6,000,000
Maryland:													
Chesapeake and Ohio.....	Washington, D. C.-Cumberland, Md.....	1	1850	185.00	181.20	3.80	68	31	6	75	100	15	14,000,000
Pennsylvania.....		2	.....	197.88	146.26	51.62	.....	.....	.....	146	.....	.....	18,085,334
Schuylkill Navigation Co....	Philadelphia-Port Clinton.....	1826	.....	89.88	50.26	39.62	58	40	6	55	110	18	11,018,875
Lehigh Coal and Navigation Co.....	Coalport-Easton-Bristol.....	1821	.....	108.00	96.00	12.00	44	18	6	91	100	22	
Delaware:													
Chesapeake and Delaware <sup>3</sup> ...	Delaware river-Chesapeake bay.....	1	1829	29.63	13.63	16.00	60	40	10	3	220	24	5,000,000
Virginia.....		2	.....	37.00	36.00	1.00	.....	.....	.....	3	.....	.....	4,452,849
Albemarle and Chesapeake <sup>3</sup> ...	Chesapeake bay-Albemarle sound.....	.....	1860	14.00	14.00	.....	80	45	10	1	220	40	1,151,849
Lake Drummond (Dismal Swamp). <sup>3</sup>	Elizabeth river, Va.-Pasquotank river, N. C.....	.....	1704	23.00	22.00	1.00	70	40	9	2	250	39	3,301,000

<sup>1</sup> The figures relating to Government canals and canalized rivers were obtained from the reports of the Chief of Engineers of the United States Army and those for state and corporation canals directly from the canal officials.

<sup>2</sup> State canal.

<sup>3</sup> Ship canal.

TABLE 62.—NUMBER, DIMENSIONS, DATE OF CONSTRUCTION, AND COST OF STATE AND CORPORATION CANALS, GOVERNMENT CANALS, AND CANALIZED RIVERS: 1906—Continued.

STATE AND NAME.	Points connected.	Number of canals.	Opened for traffic.	LENGTH.			WIDTH.		Depth (feet).	LOCKS.			Cost of construction and improvement.
				Total (miles).	Canal (miles).	Slack water (miles).	Surface (feet).	Bottom (feet).		Number.	Length (feet).	Width (feet).	
North Carolina.....		2	.....	9.00	9.00	.....	.....	.....	.....	.....	.....	.....	\$95,000
Fairfield <sup>1</sup> .....	Fairfield and Alligator river.	.....	1868	4.00	4.00	.....	26	26	7	.....	.....	.....	60,000
Newbern and Beaufort <sup>1</sup> .....	Clubfoot and Harlow creeks.	.....	1882	5.00	5.00	.....	.....	.....	5	.....	.....	.....	35,000
Georgia: Augusta <sup>1</sup> .....	Augusta-Savannah river ..	1	1847	9.00	7.00	2.00	150	106	11	1	100	15	2,090,263
Louisiana.....		5	.....	121.85	121.35	0.50	.....	.....	.....	3	.....	.....	3,400,000
New Basin <sup>1</sup> .....	New Orleans-Lake Ponchartrain.	.....	1835	7.50	7.00	0.50	100	90	9	.....	.....	.....	2,000,000
Old Basin <sup>1</sup> .....	New Orleans-St. Johns bayou.	.....	1794	7.00	7.00	.....	60	40	7	.....	.....	.....	150,000
Harvey's <sup>1</sup> .....	Mississippi river at New Orleans-Barataria bayou.	.....	1830	5.35	5.35	.....	70	65	6	1	184	30	400,000
Company's <sup>1</sup> .....	Mississippi river at New Orleans-Lafourche bayou.	.....	1847	95.00	95.00	.....	60	45	5.5	1	174	28	500,000
Lake Borne <sup>1</sup> .....	Mississippi river-Lake Borne.	.....	1900	7.00	7.00	.....	100	85	6	1	280	44	350,000
Texas: Morris and Cummings <sup>1</sup> .....	Corpus Christi-Aransas bay.	1	1873	9.00	9.00	.....	100	60	8	.....	.....	.....	125,000
Ohio.....		2	.....	595.00	589.00	6.00	.....	.....	.....	230	.....	.....	15,967,651
Ohio and branches <sup>2</sup> .....	Cleveland-Portsmouth.....	.....	1835	326.00	326.00	.....	40	26	4	144	90	15	7,904,971
Miami and Erie <sup>2</sup> .....	Toledo-Cincinnati.....	.....	1835	269.00	263.00	6.00	50	35	5	95	90	15	8,062,680
Illinois.....		2	.....	130.00	124.00	6.00	.....	.....	.....	18	.....	.....	61,891,993
Illinois and Michigan <sup>2</sup> .....	Chicago-Lasalle.....	.....	1848	96.00	96.00	.....	60	30	8	{ 1 17 }	110	{ 48 18 }	9,194,408
Chicago Drainage and Ship <sup>1</sup> .....	Chicago-Lockport.....	.....	1900	34.00	28.00	6.00	244	158	22	.....	.....	.....	52,697,495
Oregon: Portland General Electric Co. <sup>1</sup> .....	Around Falls of Willamette river at Oregon City.	1	1873	0.75	0.75	.....	75	55	6	5	210	40	750,000
Government canals.....		12	.....	78.19	73.79	4.40	.....	.....	.....	12	.....	.....	26,524,588
Michigan.....		3	.....	10.54	10.54	.....	.....	.....	.....	2	.....	.....	13,282,305
St. Marys Falls.....	{ Around falls of St. Marys river.	.....	1855	1.60	1.60	.....	160	.....	25	2	{ 515 800 }	{ 80 100 }	8,000,000
Lake Superior (including Keweenaw Bay and Portage Lake canals).....	Lake Superior, Portage Lake, Keweenaw bay.	.....	1873	7.75	7.75	.....	120	.....	20	.....	.....	.....	4,246,728
St. Clair Flats.....	St. Clair river-Lake St. Clair.	.....	1889	1.19	1.19	.....	.....	.....	20	.....	.....	.....	1,035,577
Illinois: Illinois and Mississippi.....	Around falls of Rock river, at Milan, Ill.	1	1895	4.50	4.50	.....	.....	.....	7	3	170	35	547,230
Wisconsin: Sturgeon Bay and Lake Michigan Ship.....	Sturgeon bay-Lake Michigan.	1	1881	1.36	1.36	.....	160	.....	21	.....	.....	.....	504,596
Kentucky: Louisville and Portland.....	{ Around falls of Ohio river at Louisville.....	1	1830	2.40	2.40	.....	.....	.....	12	{ 2 2 }	{ 390 200 }	{ 80 50 }	5,856,230
South Carolina.....		2	.....	5.33	5.33	.....	.....	.....	.....	.....	.....	.....	222,175
Fenwicks Island.....	South Edisto and Ashepoo rivers.	.....	1906	0.33	0.33	.....	90	.....	7	.....	.....	.....	50,000
Esterville-Minim Creek.....	Santee river-Winyah bay.	.....	1906	5.00	5.00	.....	90	.....	6	.....	.....	.....	172,175
Texas.....		3	.....	42.06	42.06	.....	.....	.....	.....	.....	.....	.....	1,445,163
Port Arthur.....	Taylor's bayou-Sabine pass.	.....	1899	7.13	7.13	.....	183	75	25	.....	.....	.....	803,490
Galveston and Brazos.....	Oyster bay-Brazos river.	.....	1853	29.50	29.50	.....	37½	.....	3	.....	.....	.....	369,698
Morgan Canal and Cut.....	Galveston bay-Buffalo bayou.	.....	1876	5.43	5.43	.....	180	.....	17	.....	.....	.....	271,975
Iowa: Des Moines Rapids.....	{ Keokuk-Nashville..... Nashville-Montrose.....	1	1877	12.00	7.60	4.40	250	.....	5	3	325	80	4,666,889
Canalized rivers.....		23	.....	1,520.40	1,520.40	.....	.....	.....	.....	138	.....	.....	42,886,978
Arkansas: Upper White.....	8 miles above to 1 mile below Batesville.	1	.....	9.00	.....	9.00	.....	.....	5	2	175	36	684,110
Pennsylvania.....		3	.....	151.50	.....	151.50	.....	.....	.....	21	.....	.....	9,747,795
Monongahela.....	Pittsburg-Dunkards creek.	.....	1888	89.00	.....	89.00	.....	.....	5.4	{ 6 6 6 }	{ 216 182 600 }	{ 56 110 56 }	3,954,466
Ohio.....	Pittsburg-Beaver.....	.....	1885	36.50	.....	36.50	.....	.....	6	6	600	110	4,668,561
Allegheny.....	Pittsburg-Natrona.....	.....	1903	26.00	.....	26.00	.....	.....	6	3	290	56	1,124,768

<sup>1</sup> Ship canal.<sup>2</sup> State canal.



TABLE 62.—NUMBER, DIMENSIONS, DATE OF CONSTRUCTION, AND COST OF STATE AND CORPORATION CANALS, GOVERNMENT CANALS, AND CANALIZED RIVERS: 1906—Continued.

STATE AND NAME.	Points connected.	Number of canals.	Opened for traffic.	LENGTH.			WIDTH.		Depth (feet).	LOCKS.			Cost of construction and improvement.
				Total (miles).	Canal (miles).	Slack water (miles).	Surface (feet).	Bottom (feet).		Number.	Length (feet).	Width (feet).	
West Virginia.....		3		179.00		179.00				22			\$6,404,344
Great Kanawha.....	Loup creek shoals—Point Pleasant.....		1889	90.00		90.00			6	4	300	50	4,165,630
Little Kanawha.....	Parkersburg—Creston.....		1889	48.00		48.00			4	5	143	23	519,107
Monongahela.....	State line—Fairmount.....		1899	41.00		41.00			7	7	182	56	1,719,587
South Carolina: Congaree.....	Gervais street bridge, Columbia—Granby.....	1	1906	2.00		2.00			5	1	150	55	221,238
Ohio: Muskingum.....	Zanesville—Marietta.....	1	1840	75.00		75.00			7	10	160	36	2,121,738
Illinois.....		3		241.00		241.00				6			3,193,706
Illinois <sup>1</sup> .....	Lasalle—Grafton.....		1889	227.00		227.00			7	4	350	75	2,963,706
Wabash.....	Grand Rapids at Mt. Carmel.....		1893	12.00		12.00			3.5	1	214	52	130,000
Galena.....			1894	2.00		2.00			2	1	307	52	100,000
Wisconsin: Fox.....	Portage city—Green Bay.....	1	1856	160.40		160.40			5	27	160	35	3,149,296
Kentucky.....		4		469.50		469.50				22			4,656,564
Kentucky.....	Carrollton—College Hill.....		1889	200.00		200.00			5	5	145	38	2,798,922
Green and Barren.....	Mouth Green river—Mammoth Cave.....		1889	193.00		193.00			5	6	148	52	661,633
Big Sandy.....	Mouth Barren river—Bowling Green.....		1889	20.00		20.00			5	7	145	36	1,091,108
Rough.....	Louisia—Kavanaugh.....		1889	27.00		27.00			6	3	190	52	104,899
Tennessee.....	Mouth—Hartford.....		1896	29.50		29.50			6	1	123	27	5,424,363
Tennessee.....		2		94.50		94.50				14			2,232,637
Cumberland.....	Nashville above and below.....		1889	76.50		76.50			6	3	280	52	3,191,726
Tennessee.....	Around Muscle shoals.....		1889	14.50		14.50			5	9	285	60	3,264,811
Tennessee.....	Around Elk river shoals.....		1889	3.50		3.50			5	2	285	60	2,223,888
Alabama.....		2		116.00		116.00				10			1,040,928
Black Warrior.....	12 miles above Tuscaloosa.....		1889	91.00		91.00			6.5	7	322	52	4,019,014
Coosa.....	79 miles below Tuscaloosa.....		1888	25.00		25.00			4	3	175	40	202,620
Oregon.....	Greenport, Ala., to 25 miles below.....												3,816,394
Yamhill.....	Mouth—McMinnville.....		1900	18.00		18.00			5	1	265	40	
Columbia.....	Around the Cascades.....		1889	4.50		4.50			8	2	462	92	

<sup>1</sup>The Federal Government controls 139 miles and the state of Illinois 88 miles.

#### CONGRESSIONAL APPROPRIATIONS.

For many years the Federal Government has been expending large sums of money for the survey, improvement, and maintenance of the harbors and waterways of the United States. The first appropriation for this purpose was made in 1802, when Congress authorized the Secretary of the Treasury to expend a sum not exceeding \$30,000 on public piers in the Delaware river.

The data on this subject have been compiled from the reports of the Chief of Engineers of the United States Army. The figures are from the compilation of preliminary examinations, surveys, projects, and appropriations prepared in accordance with section 13 of the rivers and harbors act of June 13, 1902, and pub-

lished in House Document 421, Fifty-seventh Congress, second session, from the report of the chief of engineers for the fiscal year ending June 30, 1906, and the rivers and harbor acts of March 2, 1907. The differences which exist between the figures shown at the census of 1890 and those presented at the present census for the period up to and including that year are due either to the inclusion of some figures in the present report under a different locality from the one shown in 1890, to the diversion of appropriations from the original project, or to apparent errors in the earlier census.

The Congressional appropriations in Table 63 are arranged according to districts corresponding with those followed in presenting the statistics for water transportation.

TABLE 63.—*Congressional appropriations for the survey, improvement, and maintenance of harbors and waterways of the United States, by periods and divisions.*

DIVISION.	Date of earliest appropriation.	APPROPRIATIONS.			
		Total.	Up to and including 1890.	1891 to 1906, inclusive.	March 2, 1907.
Total.....	1802	\$552,943,025	\$214,039,886	\$301,447,046	\$37,456,093
Atlantic coast.....	1802	141,162,391	56,448,541	73,821,326	10,892,524
Gulf of Mexico.....	1826	64,202,362	21,065,470	38,027,940	5,198,952
Pacific coast.....	1852	34,061,782	10,248,592	21,204,844	2,608,346
Great Lakes.....	1823	97,791,108	37,522,937	50,980,283	9,287,888
Mississippi valley..	1819	208,484,720	84,211,783	115,457,054	8,815,883
Lake Champlain....	1836	1,347,910	1,133,660	211,750	2,500
General.....	1824	25,802,752	3,408,903	1,743,849	650,000

<sup>1</sup> Does not include appropriations for the following: California Debris Commission; Permanent International Commission of Congresses of Navigation; International Waterway Commission; improvement of harbors and waterways in insular possessions; prevention of deposits in New York harbor; bridge construction.

<sup>2</sup> Includes general appropriation items for removal of wrecks, examinations, surveys, and contingencies which are not capable of being segregated according to divisions.

Up to and including 1890 the Congressional appropriations amounted to 38.7 per cent of the total shown in this table. From 1891 to 1906, inclusive, 54.5 per cent of the total was appropriated, while the rivers and harbors act of March 2, 1907, authorized the expenditure of 6.8 per cent. The waterways of the Mississippi valley, including the Red River (of the North), have received 37.7 per cent of all Congressional appropriations for the improvement and maintenance of harbors and waterways; the harbors and streams of the Atlantic coast, 25.5 per cent; those of the Great Lakes, 17.7 per cent; the Gulf of Mexico, including the delta and passes of the Mississippi, 11.6 per cent; the Pacific coast, 6.2 per cent; and Lake Champlain, two-tenths of 1 per cent.

TABLE 64.—ALL VESSELS, BY CLASS,

	Number of ves- sels.	TONNAGE.		RIGGED.				HORSEPOWER OF ENGINES.		
		Gross.	Net.	Screw.	Side wheel.	Stern wheel.	All other.	Steam.	Gasoline.	All other.
Aggregate.....	37,321	12,893,429	11,484,833	7,952	562	1,406	7	3,378,453	73,204	88
Steam.....	9,927	4,059,521	2,918,476	7,952	562	1,406	7	3,378,453	73,204	88
Freight and passenger.....	3,615	3,411,588	2,474,183	2,766	285	564	.....	2,255,295	20,417	.....
Tugs and other towing vessels.....	3,079	261,375	174,373	2,428	27	624	.....	637,950	7,336	.....
Ferryboats.....	536	261,073	187,238	188	228	113	7	264,414	1,245	.....
Yachts.....	2,176	82,275	54,123	2,093	7	76	.....	162,032	39,871	80
All other.....	521	43,210	28,559	477	15	29	.....	58,762	4,335	8
Sail.....	7,131	1,704,277	1,539,513	.....	.....	.....	.....	.....	.....	.....
Freight and passenger.....	5,181	1,672,862	1,510,658	.....	.....	.....	.....	.....	.....	.....
Yachts.....	1,594	24,155	22,176	.....	.....	.....	.....	.....	.....	.....
All other.....	356	7,260	6,679	.....	.....	.....	.....	.....	.....	.....
Unrigged.....	20,263	7,129,631	7,026,844	.....	.....	.....	.....	.....	.....	.....
Canal boats.....	2,237	303,581	292,386	.....	.....	.....	.....	.....	.....	.....
All other.....	18,026	6,826,050	6,734,458	.....	.....	.....	.....	.....	.....	.....
Atlantic coast and Gulf of Mexico.....	20,032	4,851,421	4,186,451	4,858	370	183	2	1,712,382	45,932	64
Steam.....	5,413	1,457,894	972,320	4,858	370	183	2	1,712,382	45,932	64
Freight and passenger.....	1,523	1,045,811	704,560	1,225	194	104	.....	992,963	10,214	.....
Tugs and other towing vessels.....	1,690	148,992	90,021	1,606	11	73	.....	381,051	1,506	.....
Ferryboats.....	270	162,834	113,531	111	156	1	2	158,140	195	.....
Yachts.....	1,577	70,461	45,228	1,573	1	3	.....	142,203	30,706	56
All other.....	353	29,796	18,980	343	8	2	.....	38,025	3,311	8
Sail.....	5,920	1,132,905	1,012,197	.....	.....	.....	.....	.....	.....	.....
Freight and passenger.....	4,227	1,105,901	987,398	.....	.....	.....	.....	.....	.....	.....
Yachts.....	1,358	21,046	19,317	.....	.....	.....	.....	.....	.....	.....
All other.....	335	5,958	5,482	.....	.....	.....	.....	.....	.....	.....
Unrigged.....	8,699	2,260,622	2,201,934	.....	.....	.....	.....	.....	.....	.....
Canal boats.....	663	103,877	101,195	.....	.....	.....	.....	.....	.....	.....
All other.....	8,036	2,156,745	2,100,739	.....	.....	.....	.....	.....	.....	.....
Pacific coast (including Alaska).....	2,537	977,687	770,376	837	38	191	.....	435,020	10,697	.....
Steam.....	1,066	518,107	349,403	837	38	191	.....	435,020	10,697	.....
Freight and passenger.....	604	451,270	301,336	455	5	144	.....	355,849	6,333	.....
Tugs and other towing vessels.....	313	24,151	15,290	272	2	39	.....	47,764	2,520	.....
Ferryboats.....	47	40,171	31,018	10	31	6	.....	29,079	86	.....
Yachts.....	66	1,065	764	66	.....	.....	.....	810	1,237	.....
All other.....	36	1,450	995	34	.....	2	.....	1,518	521	.....
Sail.....	666	305,283	277,295	.....	.....	.....	.....	.....	.....	.....
Freight and passenger.....	547	302,798	275,060	.....	.....	.....	.....	.....	.....	.....
Yachts.....	104	1,459	1,298	.....	.....	.....	.....	.....	.....	.....
All other.....	15	1,026	937	.....	.....	.....	.....	.....	.....	.....
Unrigged.....	805	154,297	143,678	.....	.....	.....	.....	.....	.....	.....
Canal boats.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
All other.....	805	154,297	143,678	.....	.....	.....	.....	.....	.....	.....
Great Lakes and St. Lawrence river.....	2,990	2,392,863	1,905,176	1,616	51	8	1	976,847	5,700	8
Steam.....	1,676	1,915,786	1,452,228	1,616	51	8	1	976,847	5,700	8
Freight and passenger.....	932	1,842,251	1,406,674	890	37	5	.....	811,004	1,333	.....
Tugs and other towing vessels.....	382	22,663	13,312	376	5	1	.....	89,451	164	.....
Ferryboats.....	48	35,581	21,621	43	3	1	1	49,001	116	.....
Yachts.....	236	6,210	4,280	235	.....	1	.....	12,387	3,923	8
All other.....	78	9,081	6,341	72	6	.....	.....	15,004	164	.....
Sail.....	531	265,571	249,535	.....	.....	.....	.....	.....	.....	.....
Freight and passenger.....	403	263,837	247,891	.....	.....	.....	.....	.....	.....	.....
Yachts.....	122	1,458	1,384	.....	.....	.....	.....	.....	.....	.....
All other.....	6	276	260	.....	.....	.....	.....	.....	.....	.....
Unrigged.....	783	211,506	203,413	.....	.....	.....	.....	.....	.....	.....
Canal boats.....	6	1,134	1,122	.....	.....	.....	.....	.....	.....	.....
All other.....	777	210,372	202,291	.....	.....	.....	.....	.....	.....	.....
Mississippi river and its tributaries.....	9,622	4,411,967	4,379,064	356	85	990	4	227,802	9,167	.....
Steam.....	1,435	146,227	129,227	356	85	990	4	227,802	9,167	.....
Freight and passenger.....	390	55,779	49,997	67	36	287	.....	78,451	2,241	.....
Tugs and other towing vessels.....	619	62,836	53,821	106	7	506	.....	114,696	2,851	.....
Ferryboats.....	166	22,180	20,791	22	35	105	4	27,372	848	.....
Yachts.....	222	3,255	2,923	146	6	70	.....	3,571	2,971	.....
All other.....	38	2,177	1,695	15	1	22	.....	3,712	256	.....
Unrigged.....	8,187	4,265,740	4,249,837	.....	.....	.....	.....	.....	.....	.....
Canal boats.....	2	323	323	.....	.....	.....	.....	.....	.....	.....
All other.....	8,185	4,265,417	4,249,514	.....	.....	.....	.....	.....	.....	.....

<sup>1</sup> The quantity of freight carried on the Great Lakes and St. Lawrence river was obtained from the report of the Bureau of Statistics on the internal commerce of the United States. As this report does not show separately the freight carried on each class of vessels, the total for the United States could not be obtained by classes.

## OCCUPATION, AND DIVISION: 1906.

CONSTRUCTION.				Value of vessels.	INCOME.			Number of employees.	Wages.	Number of passengers carried.	Freight carried (net tons). <sup>1</sup>
Iron.	Steel.	Wood.	Composite.		Freight.	Passengers.	All other.				
531	1,448	35,247	95	\$507,973,121	\$175,545,361	\$43,645,365	\$75,663,806	140,929	\$71,636,521	366,825,663	177,520,799
485	1,189	8,197	56	386,772,727	132,473,492	43,591,987	49,482,310	95,452	50,504,508	366,322,769	
218	690	2,090	17	286,218,089	119,869,929	33,114,629	8,111,773	61,908	30,579,417	35,302,577	
169	251	2,649	10	39,062,249	12,555,487	62,117	31,325,724	20,870	12,494,685	281,103	
64	92	379	1	29,578,380	10,414,106	6,876,967	4,519	4,519	3,537,180	330,737,639	
13	121	2,016	26	24,281,861	135	25,590	5,858	5,858	2,291,951	700	
21	35	463	2	7,632,148	48,076	1,000	3,142,256	2,297	1,601,275	750	
37	94	6,973	27	56,206,145	31,954,145	35,072	697,973	25,404	10,371,047	24,915	
34	76	5,069	2	51,415,756	31,953,165	33,272	482,276	22,945	9,641,346	23,475	
3	18	1,549	24	4,169,253	980	1,800	2,853	1,949	556,777		
		355	1	621,136			212,844	510	172,924	1,440	
9	165	20,077	12	64,994,249	11,117,724	18,306	25,483,523	20,073	10,760,966	477,979	
	9	2,227	1	2,952,197	2,951,753		386,594	2,772	1,015,591		
9	156	17,850	11	62,042,052	8,165,971	18,306	25,096,929	17,301	9,745,375	477,979	
414	734	18,827	57	273,105,915	83,890,161	25,643,332	50,226,431	77,124	38,352,259	292,555,416	65,360,958
385	608	4,388	32	193,926,327	57,803,325	25,601,845	32,039,317	45,388	24,433,617	292,292,820	19,340,893
156	239	1,123	5	121,136,485	48,644,095	18,185,239	5,418,472	25,177	11,773,117	19,508,104	19,109,272
140	183	1,363	4	25,894,551	9,152,820	29,693	21,272,061	11,276	7,528,564	188,046	222,540
61	66	143		19,970,466		7,386,913	3,184,621	2,388	2,098,540	272,596,670	
9	98	1,449	21	21,290,339			16,040	5,088	2,016,936		
19	22	310	2	5,634,486	6,410		2,148,123	1,459	1,016,460		9,081
24	52	5,820	24	37,520,903	19,542,231	24,926	474,858	18,654	6,687,314	22,128	18,637,842
22	35	4,168	2	33,213,849	19,541,366	23,126	284,690	16,374	6,016,394	20,688	18,630,901
2	17	1,317	22	3,775,743			524,374	1,835	524,374		
		335		531,311	865	1,800	187,487	445	146,546	1,440	6,941
5	74	8,619	1	41,658,685	6,544,605	16,561	17,712,256	13,082	7,231,328	240,468	27,382,223
		663		1,112,475	606,427		337,125	652	281,599		1,104,209
5	74	7,956	1	40,546,210	5,938,178	16,561	17,375,131	12,430	6,949,729	240,468	26,278,014
57	73	2,404	3	76,622,633	29,340,102	10,424,493	8,755,544	20,142	12,950,399	44,189,971	13,301,293
42	63	959	2	60,440,145	20,600,325	10,414,347	6,272,798	14,423	9,330,294	44,187,184	6,685,007
37	49	517	1	52,164,977	20,065,562	8,365,559	1,200,954	11,978	7,281,028	4,631,500	6,673,310
4	10	299		3,353,927	534,463	10,208	2,761,267	1,548	1,248,085	22,580	11,637
	2	44	1	4,315,822		2,037,580	2,170,850	759	708,777	39,532,354	
	1	65		294,800			2,500	66	33,271		
1	1	34		310,919	300	1,000	77,227	72	59,133	750	60
12	8	645	1	11,533,171	8,090,122	10,146	199,483	4,481	2,719,571	2,787	3,437,372
12	8	527		11,275,586	8,090,007	10,146	177,626	4,401	2,683,528	2,787	3,437,197
		104		174,110			100	28	11,890		
		14	1	83,475	115		21,757	52	24,153		175
3	2	800		4,649,317	649,655		2,283,263	1,238	900,534		3,178,914
3	2	800		4,649,317	649,655		2,283,263	1,238	900,534		3,178,914
33	539	2,391	27	130,805,640	52,076,533	4,866,904	8,331,265	24,916	13,280,716	14,080,146	75,610,690
32	457	1,172	15	116,983,812	47,227,424	4,866,904	4,245,899	20,515	11,179,882	14,080,146	
24	388	510	10	107,897,440	46,832,834	4,408,880	1,271,337	17,279	9,269,490	5,814,639	
6	33	342	1	2,630,097	357,944	1,168	2,115,009	1,659	1,081,913	1,025	
	14	34		3,429,532		456,856	465,982	656	308,156	8,264,482	
2	10	220	4	1,678,000			4,422	441	151,055		
	12	66		1,353,743	36,646		389,149	480	369,268		
1	34	494	2	7,135,271	4,317,542		23,632	2,258	962,542		
	33	370		6,924,071	4,317,542		19,960	2,161	940,174		
1	1	118	2	204,850			72	84	20,143		
		6		6,350			3,600	13	2,225		
	48	725	10	6,086,557	531,567		4,061,734	2,143	1,138,292		
		6		13,800	6,500		1,290	15	2,801		
	48	719	10	6,672,757	525,067		4,060,444	2,128	1,135,491		
26	81	9,513	2	22,852,142	7,450,869	2,281,243	7,609,926	15,016	5,692,117	14,122,241	19,531,093
25	50	1,358	2	13,196,770	6,480,655	2,279,998	6,649,483	13,973	5,148,581	13,890,850	2,355,386
1	9	379	1	3,737,450	4,038,002	1,766,581	130,046	6,746	2,019,202	3,808,850	2,305,867
18	22	578	1	6,822,210	2,442,653	14,535	4,953,055	6,109	2,512,108	58,688	49,519
3	10	153		1,776,360		498,747	1,054,374	699	413,553	10,022,612	
2	9	211		563,400		135	1,988	165	59,168	700	
1		37		297,350			510,020	254	144,550		
1	31	8,155		9,655,372	970,214	1,245	960,443	1,043	543,536	231,391	17,175,707
		2		4,100	12,500			8	2,000		23,250
1	31	8,153		9,651,272	957,714	1,245	960,443	1,035	541,536	231,391	17,152,457



## OCCUPATION, AND DIVISION: 1906—Continued.

CONSTRUCTION.				Value of vessels.	INCOME.			Number of employees.	Wages.	Number of passengers carried.	Freight carried (net tons).
Iron.	Steel.	Wood.	Composite.		Freight.	Passengers.	All other.				
1	10	1,661	3	\$3,334,221	\$2,233,920	\$264,397	\$318,287	2,499	\$929,710	835,052	2,642,891
1	9	139	2	1,390,512	118,363	263,897	143,710	590	192,238	828,932	103,998
1	5	74	2	898,500	104,398	259,037	19,804	407	114,443	804,411	100,655
	3	32		222,812	13,965	850	122,766	128	60,795	3,000	3,343
		2		6,500		4,010	1,140	5	2,154	21,521	
	1	31		262,700				50	14,846		
		13		16,000	4,250			11	1,620		6,968
		4		2,250	4,250			9	1,250		6,968
		9		13,750				2	370		
	1	1,509	1	1,927,709	2,111,307	500	174,577	1,898	735,852	6,120	2,531,925
		1,363	1	1,583,835	2,036,098		13,179	1,582	588,672		2,204,975
	1	146		343,874	75,209	500	161,398	316	147,180	6,120	236,950
	11	451	3	1,252,570	553,776	164,996	422,353	1,232	431,329	1,042,837	1,073,874
	2	181	3	835,161	243,400	164,996	131,103	563	219,896	1,042,837	155,817
		87		383,237	185,038	129,333	11,160	321	122,137	735,073	141,017
		35	2	138,652	53,642	5,603	101,596	150	63,220	7,764	5,600
		3		80,000		30,000		12	6,000	300,000	
	2	40	1	197,622			640	48	16,675		
		16		35,650	4,720		17,737	32	11,864		9,200
		1		800							
	9	269		416,609	310,376		291,250	609	211,424		918,057
	9	193		237,987	290,228		35,000	515	140,519		733,189
		76		178,622	20,148		256,250	154	70,905		184,868



TABLE 65.—ALL VESSELS, BY CLASS, OWNERSHIP, AND DIVISION: 1906.

	Number of vessels.	Gross tonnage.	CONSTRUCTION.				Value of vessels.	Gross income.	Number of employees.	Wages.	Number of passengers carried.
			Iron.	Steel.	Wood.	Composite.					
Aggregate.....	37,321	12,893,429	531	1,448	35,247	95	\$507,973,121	\$294,854,532	140,929	\$71,636,521	366,825,663
Individual.....	12,944	1,462,818	63	189	12,634	58	65,833,525	32,307,887	33,362	13,426,087	9,243,750
Firm.....	4,169	929,311	33	47	4,085	4	28,807,734	24,352,990	15,065	7,346,355	4,159,376
Incorporated company.....	19,729	10,375,681	411	1,168	18,121	29	402,419,557	233,480,197	89,481	48,290,500	332,042,567
Miscellaneous.....	479	125,619	24	44	407	4	10,912,305	4,713,458	3,021	2,573,579	21,379,970
Steam.....	9,927	4,059,521	485	1,189	8,197	56	386,772,727	225,547,789	95,452	50,504,508	366,322,769
Individual.....	4,359	316,219	54	169	4,104	32	40,280,220	14,735,851	16,909	7,479,091	9,078,347
Firm.....	1,141	145,326	28	40	1,072	1	9,990,927	10,468,009	6,235	3,393,402	4,136,946
Incorporated company.....	4,224	3,555,040	380	943	2,881	20	328,906,262	198,804,054	70,831	38,177,483	331,727,506
Miscellaneous.....	203	42,936	23	37	140	3	7,595,318	1,539,875	1,477	1,454,532	21,379,970
Sail.....	7,131	1,704,277	37	94	6,973	27	56,206,145	32,687,190	25,404	10,371,047	24,915
Individual.....	4,772	483,859	7	19	4,723	23	17,854,084	10,868,065	12,285	4,187,230	22,633
Firm.....	1,403	435,756	5	2	1,393	3	12,843,869	9,289,172	6,520	2,855,740	2,049
Incorporated company.....	857	729,784	24	66	767	.....	23,493,652	11,446,101	5,825	2,989,675	233
Miscellaneous.....	99	54,878	1	7	90	1	2,014,540	1,083,852	774	338,402	.....
Unrigged.....	20,263	7,129,631	9	165	20,077	12	64,994,249	36,619,553	20,073	10,760,966	477,979
Individual.....	3,813	662,740	2	1	3,807	3	7,699,221	6,703,971	4,168	1,759,766	142,770
Firm.....	1,625	348,229	.....	5	1,620	.....	5,972,938	4,598,809	2,310	1,097,213	20,381
Incorporated company.....	14,648	6,090,857	7	159	14,473	9	50,019,643	23,230,402	12,825	7,123,842	314,828
Miscellaneous.....	177	27,805	.....	.....	177	.....	1,302,447	2,089,731	770	780,045	.....
Atlantic coast and Gulf of Mexico.....	20,032	4,851,421	414	734	18,827	57	273,105,915	159,759,924	77,124	38,352,259	292,555,416
Individual.....	8,517	844,064	45	139	8,288	45	45,457,935	16,762,779	21,620	8,185,625	4,089,186
Firm.....	2,849	666,005	29	22	2,796	2	19,636,772	15,844,013	9,585	4,549,281	1,986,229
Incorporated company.....	8,341	3,246,215	317	540	7,475	9	199,516,774	123,137,403	43,740	23,642,205	266,278,832
Miscellaneous.....	325	95,137	23	33	268	1	8,494,434	4,015,729	2,179	1,975,148	20,201,169
Steam.....	5,413	1,457,894	385	608	4,388	32	193,926,327	115,444,487	45,388	24,433,617	292,292,820
Individual.....	2,625	130,963	37	121	2,446	21	27,444,680	5,933,069	9,732	4,305,969	3,945,453
Firm.....	580	48,015	25	21	533	1	4,588,052	5,453,014	2,726	1,663,160	1,984,184
Incorporated company.....	2,072	1,244,283	301	440	1,322	9	155,819,420	102,728,451	31,919	17,375,127	266,162,014
Miscellaneous.....	136	34,633	22	26	87	1	6,074,175	1,329,953	1,011	1,089,361	20,201,169
Sail.....	5,920	1,132,905	24	52	5,820	24	37,520,903	20,042,015	18,654	6,687,314	22,128
Individual.....	4,091	338,536	6	18	4,044	23	13,245,424	6,999,030	9,775	2,888,624	20,083
Firm.....	1,189	349,135	4	1	1,183	1	10,437,943	7,071,440	5,258	2,135,143	2,045
Incorporated company.....	558	399,761	13	26	519	.....	12,110,296	5,079,132	2,975	1,397,248	.....
Miscellaneous.....	82	45,473	1	7	74	.....	1,727,240	892,413	646	266,299	.....
Unrigged.....	8,699	2,260,622	5	74	8,619	1	41,658,685	24,273,422	13,082	7,231,328	240,468
Individual.....	1,801	374,565	2	.....	1,798	1	4,767,831	3,830,680	2,113	991,032	123,650
Firm.....	1,080	268,855	.....	.....	1,080	.....	4,610,777	3,319,559	1,601	750,978	.....
Incorporated company.....	5,711	1,602,171	3	74	5,634	.....	31,587,058	15,329,820	8,846	4,869,880	116,818
Miscellaneous.....	107	15,031	.....	.....	107	.....	693,019	1,793,363	522	619,488	.....
Pacific coast (including Alaska).....	2,537	977,687	57	73	2,404	3	76,622,633	48,520,139	20,142	12,950,399	44,189,971
Individual.....	806	119,565	1	2	803	.....	6,585,265	4,923,697	3,022	1,876,325	917,552
Firm.....	275	73,131	2	2	271	.....	3,678,325	2,791,353	1,504	1,046,443	545,012
Incorporated company.....	1,404	770,404	54	69	1,279	2	65,235,015	40,297,220	15,233	9,765,577	41,571,407
Miscellaneous.....	52	14,587	.....	.....	51	1	1,124,028	507,869	383	262,054	1,156,000
Steam.....	1,066	518,107	42	63	959	2	60,440,145	37,287,470	14,423	9,330,294	44,187,184
Individual.....	320	23,015	1	2	317	.....	2,912,260	2,014,337	1,236	822,125	915,002
Firm.....	121	14,084	1	1	119	.....	1,599,400	1,304,923	698	510,006	545,008
Incorporated company.....	609	477,815	40	60	507	2	55,560,485	33,844,478	12,377	7,911,038	41,571,174
Miscellaneous.....	16	3,193	.....	.....	16	.....	368,000	123,732	112	87,125	1,156,000
Sail.....	666	305,283	12	8	645	1	11,533,171	8,299,751	4,481	2,719,571	2,787
Individual.....	366	85,227	.....	.....	366	.....	3,455,600	2,660,275	1,636	964,470	2,550
Firm.....	99	51,721	1	1	97	.....	1,934,565	1,333,520	748	496,254	4
Incorporated company.....	187	159,756	11	7	169	.....	5,866,206	4,134,060	1,978	1,192,927	233
Miscellaneous.....	14	8,579	.....	.....	13	1	276,800	171,886	119	65,920	.....
Unrigged.....	805	154,297	3	2	800	.....	4,649,317	2,932,918	1,238	900,534	.....
Individual.....	120	11,323	.....	.....	120	.....	217,405	249,085	150	89,730	.....
Firm.....	55	7,326	.....	.....	55	.....	144,360	152,900	58	40,183	.....
Incorporated company.....	608	132,833	3	2	603	.....	3,808,324	2,318,682	878	661,612	.....
Miscellaneous.....	22	2,815	.....	.....	22	.....	479,228	212,251	152	109,009	.....
Great Lakes and St. Lawrence river.....	2,990	2,392,863	33	539	2,391	27	130,805,640	65,274,702	24,916	13,280,716	14,080,146
Individual.....	975	204,175	12	32	922	9	8,355,470	5,170,969	3,572	1,642,942	1,333,019
Firm.....	429	132,836	2	15	410	2	4,025,536	4,052,492	2,386	1,131,976	592,956
Incorporated company.....	1,536	2,044,131	19	481	1,020	16	117,310,941	56,002,405	18,672	10,238,974	12,141,171
Miscellaneous.....	50	11,721	.....	11	39	.....	1,113,693	48,836	286	266,824	13,000
Steam.....	1,676	1,915,786	32	457	1,172	15	116,983,812	56,340,227	20,515	11,179,882	14,080,146
Individual.....	536	126,160	11	30	487	8	6,664,550	3,608,513	2,503	1,216,624	1,333,019
Firm.....	207	71,009	2	11	194	.....	2,813,500	2,446,025	1,554	737,711	592,956
Incorporated company.....	905	1,714,669	19	405	474	7	106,473,369	50,256,556	16,241	8,992,737	12,141,171
Miscellaneous.....	28	3,948	.....	11	17	.....	1,032,393	29,133	237	232,810	13,000
Sail.....	531	265,571	1	34	494	2	7,135,271	4,341,174	2,258	962,542	.....
Individual.....	301	59,578	1	1	299	.....	1,136,260	1,204,510	863	332,516	.....
Firm.....	115	34,900	.....	.....	113	2	471,301	884,202	514	224,343	.....
Incorporated company.....	112	170,267	.....	33	79	.....	5,517,150	2,232,909	872	399,500	.....
Miscellaneous.....	3	826	.....	.....	3	.....	10,500	19,553	9	6,183	.....
Unrigged.....	783	211,506	.....	48	725	10	6,686,557	4,593,301	2,143	1,138,292	.....
Individual.....	138	18,437	.....	1	136	1	554,660	357,946	206	93,802	.....
Firm.....	107	26,927	.....	4	103	.....	740,675	722,265	338	169,922	.....
Incorporated company.....	519	159,195	.....	43	467	9	5,320,422	3,512,940	1,559	846,737	.....
Miscellaneous.....	19	6,947	.....	.....	19	.....	70,800	150	40	27,831	.....

TABLE 65.—ALL VESSELS, BY CLASS, OWNERSHIP, AND DIVISION: 1906—Continued.

	Number of vessels.	Gross tonnage.	CONSTRUCTION.				Value of vessels.	Gross income.	Number of employees.	Wages.	Number of passengers carried.
			Iron.	Steel.	Wood.	Composite.					
Mississippi river and its tributaries.....	9,622	4,411,967	26	81	9,513	2	\$22,852,142	\$17,342,038	15,016	\$5,692,117	14,122,241
Individual.....	1,318	134,655	5	13	1,300	.....	3,114,755	3,166,478	3,132	1,038,563	2,593,811
Firm.....	533	49,346	.....	8	525	.....	1,341,901	1,527,247	1,403	564,360	974,054
Incorporated company.....	7,752	4,226,600	20	60	7,670	2	18,292,186	12,598,664	10,403	4,059,646	10,549,328
Miscellaneous.....	19	1,366	1	.....	18	.....	103,300	49,649	78	29,548	5,048
Steam.....	1,435	146,227	25	50	1,358	2	13,196,770	15,410,136	13,973	5,148,581	13,890,850
Individual.....	687	27,524	5	13	669	.....	2,394,680	2,852,034	2,942	962,389	2,580,811
Firm.....	211	11,360	.....	7	204	.....	935,875	1,217,607	1,210	465,025	953,673
Incorporated company.....	524	106,575	19	30	473	2	9,783,915	11,296,846	9,743	3,691,619	10,351,318
Miscellaneous.....	13	768	1	.....	12	.....	82,300	43,649	78	29,548	5,048
Unrigged.....	8,187	4,265,740	1	31	8,155	.....	9,655,372	1,931,902	1,043	543,536	231,391
Individual.....	631	107,131	.....	.....	631	.....	720,075	314,444	190	76,174	13,000
Firm.....	322	37,986	.....	1	321	.....	406,026	309,640	193	99,335	20,381
Incorporated company.....	7,228	4,120,025	1	30	7,197	.....	8,508,271	1,301,818	660	368,027	198,010
Miscellaneous.....	6	598	.....	.....	6	.....	21,000	6,000	.....	.....	.....
Canals and other inland waters of New York state.....	1,675	218,527	1	10	1,661	3	3,334,221	2,816,604	2,499	929,710	835,052
Individual.....	1,179	152,803	.....	1	1,177	1	1,795,585	1,863,375	1,644	545,128	160,373
Firm.....	44	4,554	.....	.....	44	.....	54,600	49,936	76	18,671	27,886
Incorporated company.....	429	59,108	1	9	419	.....	1,428,836	877,826	727	345,573	646,793
Miscellaneous.....	23	2,002	.....	.....	21	2	55,200	25,467	52	20,338	.....
Steam.....	151	14,127	1	9	139	2	1,300,512	525,970	590	192,238	828,932
Individual.....	89	5,056	.....	1	88	.....	467,400	154,141	263	89,472	154,253
Firm.....	7	182	.....	.....	7	.....	14,000	10,527	14	2,931	27,886
Incorporated company.....	49	8,572	1	8	40	.....	881,112	359,302	291	91,622	646,793
Miscellaneous.....	6	317	.....	.....	4	2	28,000	2,000	22	8,213	.....
Sail:											
Individual.....	13	495	.....	.....	13	.....	16,000	4,250	11	1,620	.....
Unrigged.....	1,511	203,905	.....	1	1,509	1	1,927,709	2,286,384	1,898	735,852	6,120
Individual.....	1,077	147,252	.....	.....	1,076	1	1,312,185	1,704,984	1,370	454,036	6,120
Firm.....	37	4,372	.....	.....	37	.....	40,600	39,409	62	15,740	.....
Incorporated company.....	380	50,596	.....	1	379	.....	547,724	518,524	436	253,951	.....
Miscellaneous.....	17	1,685	.....	.....	17	.....	27,200	23,467	30	12,125	.....
All other inland waters.....	465	40,964	.....	11	451	3	1,252,570	1,141,125	1,232	431,320	1,042,837
Individual.....	149	7,556	.....	2	144	3	524,515	420,589	372	137,504	149,809
Firm.....	39	3,439	.....	.....	39	.....	70,600	87,949	111	35,624	33,239
Incorporated company.....	267	29,163	.....	9	258	.....	635,805	566,679	706	238,525	855,036
Miscellaneous.....	10	806	.....	.....	10	.....	21,650	65,908	43	19,667	4,753
Steam.....	186	7,380	.....	2	181	3	835,161	539,499	563	219,896	1,042,837
Individual.....	102	3,501	.....	2	97	3	396,650	173,757	233	82,512	149,809
Firm.....	15	676	.....	.....	15	.....	40,100	35,913	53	14,569	33,239
Incorporated company.....	65	3,126	.....	.....	65	.....	387,961	318,421	260	115,340	855,036
Miscellaneous.....	4	77	.....	.....	4	.....	10,450	11,408	17	7,475	4,753
Sail:											
Individual.....	1	23	.....	.....	1	.....	800	.....	.....	.....	.....
Unrigged.....	278	33,561	.....	9	269	.....	416,609	601,626	669	211,424	.....
Individual.....	46	4,032	.....	.....	46	.....	127,065	246,832	139	54,962	.....
Firm.....	24	2,763	.....	.....	24	.....	30,500	52,036	58	21,055	.....
Incorporated company.....	202	26,037	.....	9	193	.....	247,844	248,258	446	123,185	.....
Miscellaneous.....	6	729	.....	.....	6	.....	11,200	54,500	26	12,192	.....